

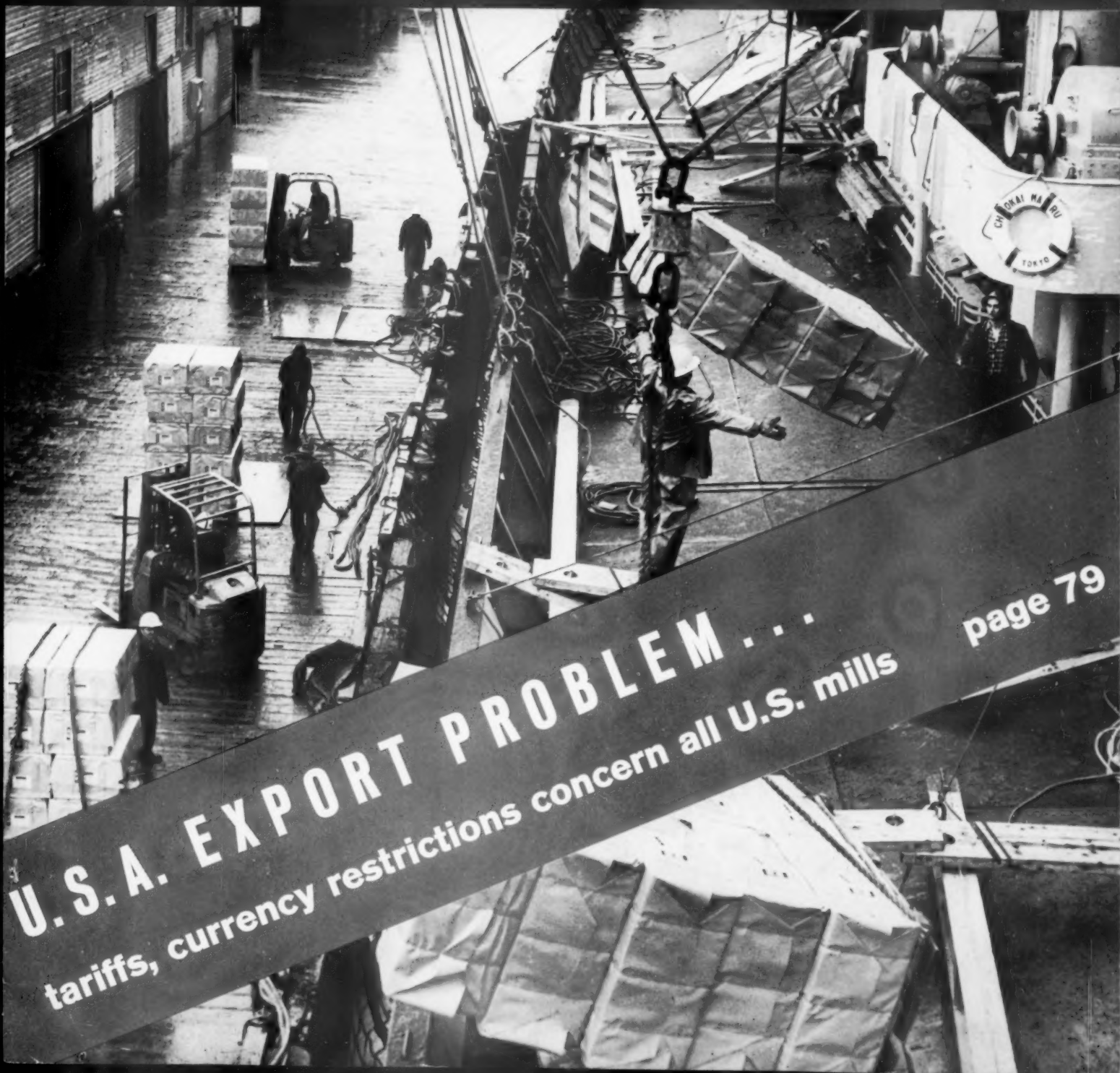
PULP & PAPER

SEPTEMBER 1960

Bowater Goes for Board
page 90

Tips on Pulp Finishing
page 96

Multi-Purpose Logger
page 122



U.S.A. EXPORT PROBLEM . . .
tariffs, currency restrictions concern all U.S. mills

page 79

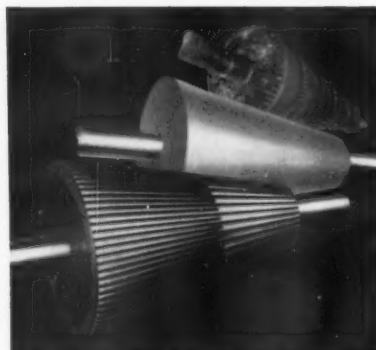
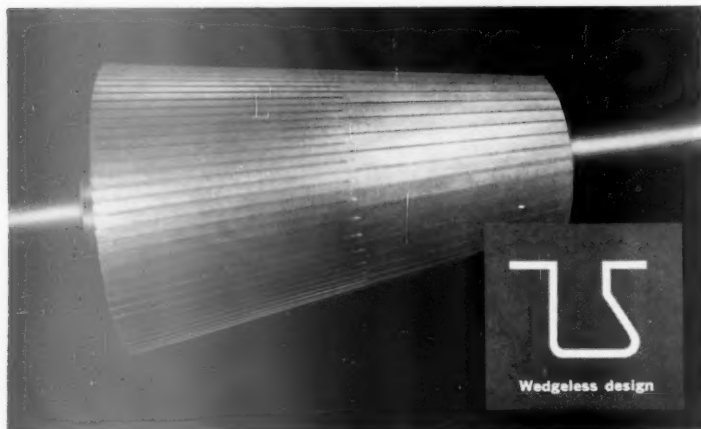
ONLY EMERSON WEDGELESS PLUGS CAN PASS THIS TEST

- because only Emerson Plugs have these design advantages!

**Before You Buy Another Jordan Plug
Check the Answers to these Questions**

Question	Emerson Wedgeless Plugs	Other Plugs
Are plugs available in stainless steel?	YES	NO
Are plugs easy to strip and fill because of bandless construction and only one knife to a slot?	YES	NO
Can a full range of knives — both single and duplex — be used interchangeably in the same plug?	YES	NO
Does the design provide impact cushions between the base of the knives and the bottom of the slots?	YES	NO
Is there $\frac{3}{4}$ " of wear depth available on all knives for long periods of Jordaning?	YES	NO
Can used plugs be jacketed with stainless steel?	YES	NO
Do bars have the advantage of Microlyzing based upon 40 years experience in custom heat treating?	YES	NO

These exclusive features are found *only* in Emerson Wedgeless Plugs. In addition, the unique design of Emerson Plugs gives you precision milled, equally-spaced slots so that when the plug is filled, *all* stock gets thorough, uniform treatment over the entire plug surface. Metal-to-metal contact in the slots adds strength and supports the knives their entire length.



Hundreds of mills have gained the advantages of Wedgeless Plug design by having their used plugs jacketed with Stainless Steel through Emerson's patented process.

DURABILITY UNMATCHED

When it comes to wear resistance and durability, try matching the high tensile strength of materials used in Wedgeless Plugs with those of other plugs: Special Stainless Steel — 125,000; Fabricated Steel — 75,000; Cast Iron — 57,500. For additional plug strength, a hammered forged steel shaft is pressed into the Emerson plug body under 60-ton hydraulic pressure. No wonder Emerson Wedgeless Plugs are stronger — more durable and serviceable than any other plugs — and specified by more papermakers.

Over thirty years ago Emerson Wedgeless led the field in Jordan plug design. It still leads today. It has never been equalled. Use Emerson Wedgeless Plugs. Buy the best. Save money, time and trouble. You have a choice of cast or fabricated plugs . . . Stainless Steel Jacket on Cast Steel body . . . Stainless Steel Jacket mounted on your old plug. *And remember, of the hundreds of used plugs jacketed with stainless steel, not one has ever failed in service.* For full information, write.

An exclusive product of



**The Emerson Manufacturing Co.
Division of John W. Bolton & Sons, Inc.
Lawrence, Massachusetts**

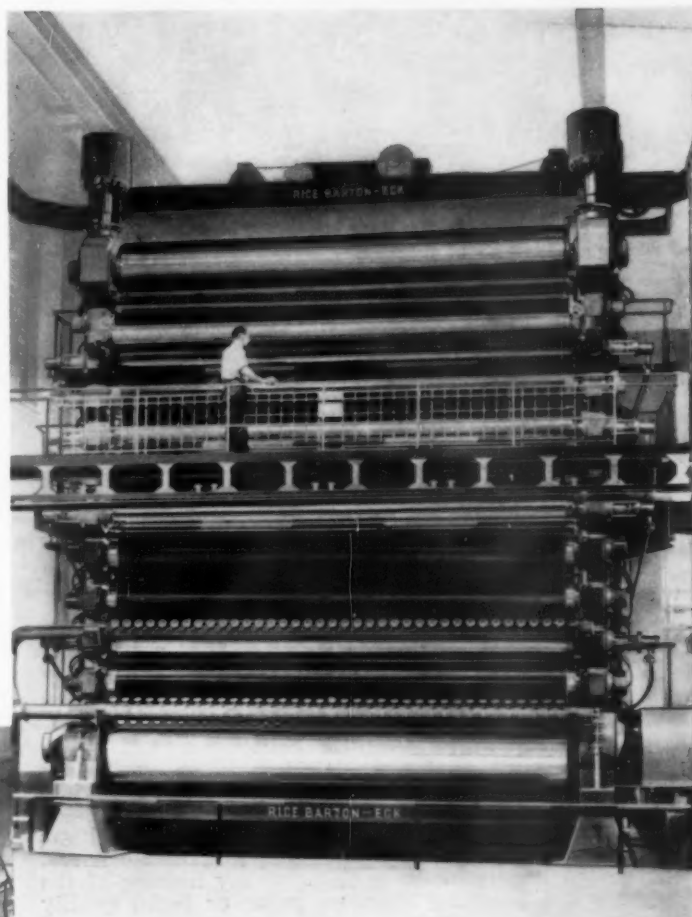
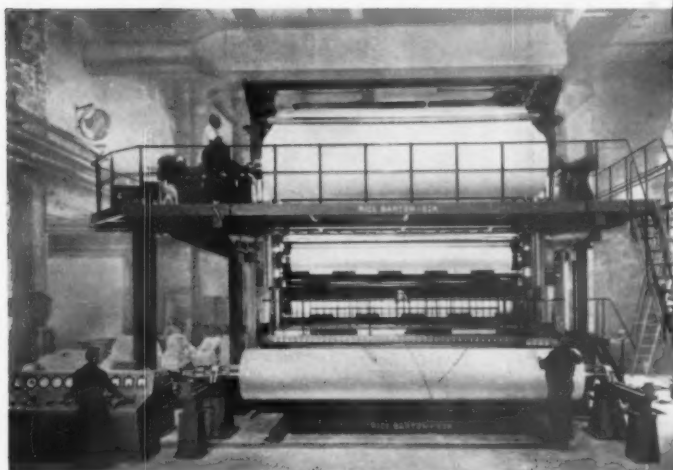
The **BIG** name in Stacks!

RICE BARTON-ECK builds HIGH SPEED SUPERCALENDERS BIG and builds them often. More than one supercalender a week was installed last year and over 350 have been installed in the past ten years.

This giant 230" stack is designed for production speeds up to 2500 f.p.m. and nip pressures up to 2000 pounds.

Here are the reasons RICE BARTON-ECK supercalenders are superior:

- High strength open front frames for faster roll changes
- Elevators both sides for easier threading and safer operation
- Hydro-pneumatic pressure system with electric automatic controls
- Unwind and rewind tension control, center or surface type with special roll handling equipment
- Automatic pressure release and quick roll lift



Above—Open front view indicates easy access to rolls. Bearings and housings come off with rolls, housings gibbed to frames. Elevators on both sides of stack are synchronized with threading speed.

Shown left—Closed side shows semi-automatic loading and unloading of rolls and reels. Unwind and wind-up by electric tension control. Control desk for electric and hydraulic systems.

For descriptive folder write today to

Rice Barton CORPORATION • WORCESTER, MASS.

FOURDRINIERS, PRESS SECTIONS, DRYER SECTIONS, CALENDERS AND SUPERCALENDERS, REELS, WINDERS, HEAD BOXES, SIZE PRESSES, BREAKER STACKS, DIFFERENTIAL DRAW CONTROL DRIVES AND CONE PULLEY DRIVES, PULPING EQUIPMENT, HIGH VELOCITY AIR DRYERS, TRAILING BLADE COATERS, FIBRE-FLASH DRYING SYSTEMS

PULP & PAPER — September 1960



Want THIS in YOUR papermaking System?



BIRD CENTRIFFLERS *take out all this junk and heavy dirt right after the pulpers*

Think what it would do if allowed to get into your Jordans, screens, pumps, wires, felts, cutters or other equipment. Bird Centrifflers quickly pay for themselves out of repair and maintenance savings, to say nothing of the beneficial effect on paper or board quality and uniformity.

Centrifflers are easy and inexpensive to install, operate and maintain. Dirt removal may be by quick acting manual or automatic dumping mechanism. Pressure discharge to Cycleans or Dirtects is readily provided when desired.

May we submit layouts and estimates?

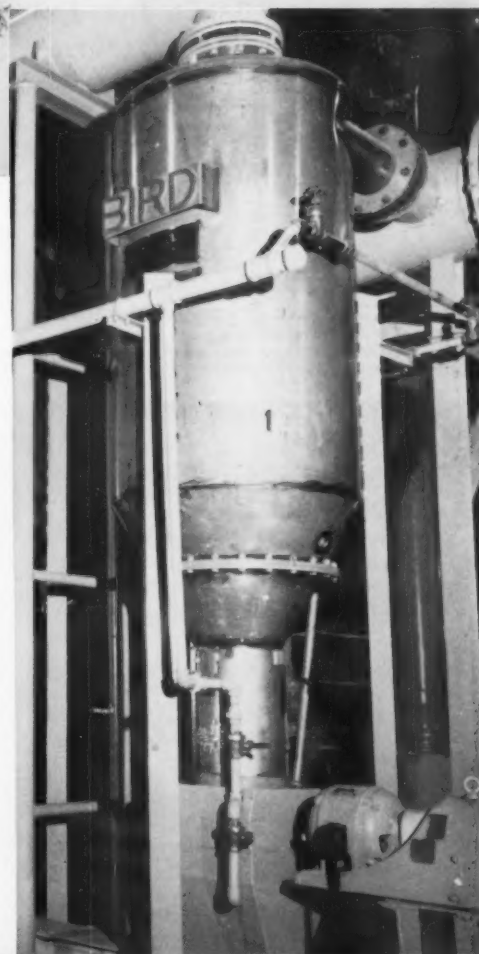
BIRD MACHINE COMPANY, South Walpole, Mass.

Regional Offices: ATLANTA 9, GEORGIA

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CANADIAN INGERSOLL-RAND COMPANY Ltd., Montreal



BIRD CENTRIFFLERS

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The U. S. A. Export Problem



Despite growth in world trade, the U.S. may have a reduced role in it because of tariff barriers being raised by European and other trading blocs. Remedies will be sought at upcoming GATT talks.

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Assessing the Total Supply



Future paper and paperboard expansion must be based upon quantity of fibers available. Pulp expert Jim Ritchie surveys future fiber prospects, discusses wood fibers, secondary fibers, grasses, synthetic fibers and bagasse.

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Bowater's Hardboard Mill



This mill may spark a new trend in combined harvesting of pine and hardwoods. Add to this a new hardboard process, ideal location for markets, new products opportunities—all wrapped up in a real depth report by Southern Editor Bill Diehl.

122

All-Purpose Logger



Woodlands men have long dreamed about a machine that would walk up to a tree, cut it down, delimb and buck it and bundle the logs all in one continuous operation. IP's Tom Busch has such a machine and it's out of the "X" stage.

CIRCULATION DEPT., 500 Howard St., San Francisco 5, Calif. C. C. Baake, Circ. Mgr. Send subscription orders and changes of address to PULP & PAPER, above address. Include both old and new addresses.

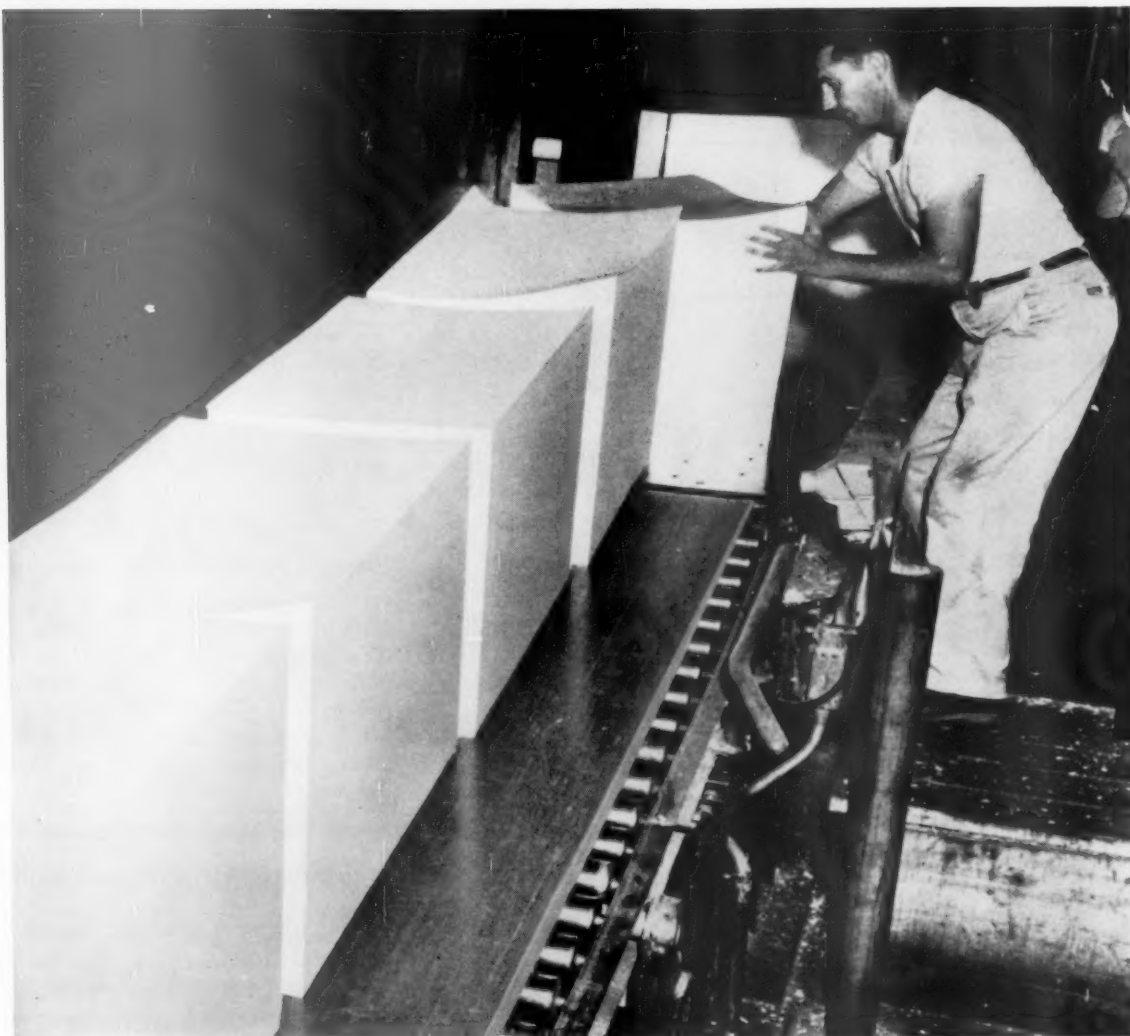
RATES (including World Review Number): U.S. and Canada—1 yr., \$5; 2 yrs., \$8; 3 yrs., \$10. Other countries—1 yr., \$7; 2 yrs., \$12; 3 yrs., \$16. Orders for payment in British Commonwealth or European funds may be sent to: Harold P. deLoose Ltd., 7 St. James Square, Manchester 2, England.

POSTMASTER: Send form 3579 to Circ. Dept. PULP & PAPER.

PULP & PAPER — September 1960

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Koroseal makes a clean haul of dissolving pulp

Smooth, nonporous conveyor belt is easy to clean, nonmarking

A company that manufactures dissolving pulp was having plenty of trouble with coated canvas conveyor belts. The belts carry stacks of this pulp which must be kept perfectly clean. Trouble was the belts cracked, were hard to clean, and weren't smooth enough to allow the stacks to shift on the belt. So when a belt was brought to a sudden stop, some of the stacks would pitch off and fall to the floor.

When a B.F. Goodrich distributor heard of the problem, he recommended a belt made of Koroseal flexible ma-

terial. The Koroseal belt has a smooth, nonporous surface. It lets the stacks slide a little when the conveyor stops, instead of jolting them off onto the floor.

The Koroseal belt shown above has now been in use four years, has not cracked, is easy to keep clean.

Koroseal conveyor belts resist scuffing, tearing, cutting. And they stand oil, grease, most acids, and just about everything else that ruins other conveyor belts.

Your B.F. Goodrich distributor has

full information on the Koroseal belt described here. And, as a factory-trained specialist in rubber products, he can answer your questions about the many other products B.F. Goodrich makes for industry. *B.F. Goodrich Industrial Products Co., Department M-905, Akron 18, Ohio.* Koroseal—T. M. Reg. U. S. Pat. Off.



September 1960 — PULP & PAPER

PULP & PAPER

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PULP & PAPER — September 1960

Address letters to The Editor, PULP & PAPER, 1791 Howard St., Chicago 26, Ill.

Making Paper To Last

Editor: PULP & PAPER'S July issue had a stimulating "Last Word" on "The Lost Half Century." As I understand it, the problem is not that the texts printed during the half century fade, but that many of the papers lose so much folding endurance and tearing strength that library volumes can not be re-bound after a few decades without the laborious and costly process of separating each sheet and reinforcing it by laminating with plastic film and "Japanese" tissue.

W. J. Barrow at the Virginia State Library in Richmond, as a result of his research under grants from the Council on Library Resources, has reported that this deterioration is a function of the acidity (low pH) of paper, and that it can be corrected by making book paper with a neutral or slightly alkaline pH. His work indicates that still further improvement can be obtained by using calcium carbonate as a filler, and getting high initial strength by using a proportion of bleached kraft fibers in the furnish. Barrow has had such paper made on a commercial scale, and has shown experimentally that it can be expected to remain in good condition for several hundred years. Results in actual practice indicate that it has good printability for letterpress work and for short offset runs.

Thus it would seem that the problem is capable of solution, and that papermakers can make long-lasting library text paper by a combination of known techniques. Perhaps the next important step is to encourage a demand for such papers by publishers of scholarly texts and journals.

ROBERT B. HOBBS
Chief, Paper Section
U.S. Department of Commerce
National Bureau of Standards

"Considerable Insight"

—Appleton, Wis.
Editor: Just a note to thank you for the excellent coverage which your July (PULP & PAPER) issue gave to our Executives' Conference. As usual, your stories showed considerable insight, and we are deeply appreciative of your interest in our affairs.

JOHN G. STRANGE
President
The Institute of Paper Chemistry

"Our Unique Endeavor"

—Baton Rouge, La.
Editor: We want you to know that our organization as a whole sincerely appreciates the fine coverage given by your magazine during the past few months. You may be sure that we will live up to the announcements and the faith shown by your organization in our unique endeavor (newsprint from 100% hardwood).

Personally, I should like to thank the Miller Freeman organization for the kindness accorded by your Mr. Bill Diehl, Mr. "Maurie" Castagne, Mr. Ken Johnson and Mr. Jack W. Rowe.

J. H. AINSWORTH
Vice President
Norallyn Paper Mills Inc.

Neal Award

—Foley, Fla.
Editor: Congratulations on winning the Associated Business Publications' (Jesse H. Neal) Award. I followed your series on the pulp and paper industry in the U. S. S. R. and enjoyed every article.

JAMES W. SOUTHERLAND
Information Services Supervisor
Buckeye Cellulose Corp.

—Mercer Is., Wash.
"I was delighted to see that you were one of the first prize award winners and recipient of the Jesse H. Neal Award Plaque in recognition of your outstanding accomplishments in the field of reporting. . . ."

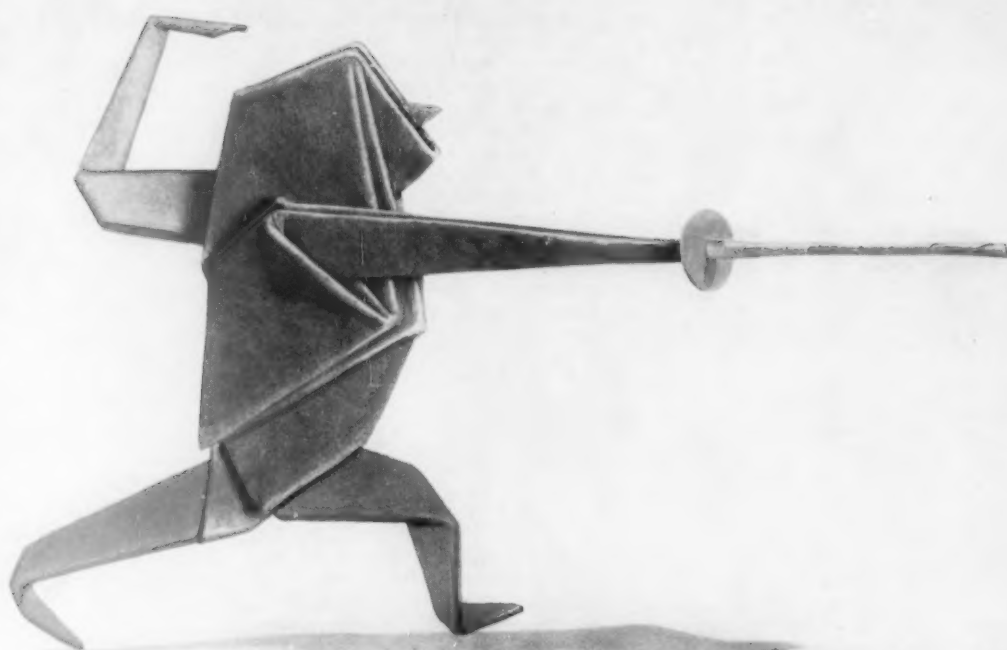
A. H. LUNDBERG
A. H. Lundberg Inc.

—St. Paul, Minn.
"Congratulations on winning the Jesse H. Neal Editorial Achievement Award for 1959.

"I read your articles on the pulp and paper industries of Soviet Russia and other European countries with much interest. . . . Your publication is of first-rank importance to everyone concerned with research and writing of forest and forest industries history."

ELWOOD R. MAUNDER
Director
Forest History Society

Paper sculpture by Giuseppe Baggi



Pulp from Gottesman means...

PERFORMANCE!

*Bleached and Unbleached Sulphite • Bleached Hardwood • Groundwood
Bleached, Semi-Bleached, and Unbleached Kraft*

**GOTTESMAN-CENTRAL NATIONAL
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Gottesman & Company Aktiebolag, Stockholm, Sweden • Central National-Gottesman Limited, London, England • Representatives in 55 Leading World Markets

MONTHLY REPORT — WORLD NEWS

PAPER, PAPERBOARD PRODUCTION UP 3.4% . . . in U. S., says APPA. Six-month output consisted of 7,900,000 tons paper, 8,000,000 tons paperboard and 1,600,000 tons construction paper and board. Only category falling below year-ago high was construction paper and board. Blame laid to declining residential construction.

MODERNIZATION ON PUGET SOUND . . . where Crown Zellerbach Corp. will spend \$2,000,000. Pulp mill and log-handling improvement at Port Townsend, Wash., will cost estimated \$1,036,000, while production changes at Port Angeles to facilitate output of telephone directory paper and newsprint on No. 1 machine will require expenditure of some \$700,000.

EARNINGS UP IN FACE OF NATIONAL DECLINE . . . paper industry earnings were up 8.5% in second quarter despite an all-industry drop of 12.9% from year ago. Fifteen pulp, paper and paper products firms reported earnings of \$53,458,000, as contrasted to \$49,273,000 in same 1959 period.

MACHINE START-UP IN OREGON . . . where Georgia-Pacific Paper Co. has put in operation its new Black-Clawson unit for production of 200 daily tons kraft bag paper. 175-in. machine equipped with Hydroflyte cantilever Fourdrinier is installed adjacent to 262-in. B-C machine for linerboard that went on the line in 1957.

UNDER-PRODUCTION RATHER THAN OVER-PRODUCTION . . . has characterized U. S. paper output during the first five months, says Tucker, Anthony & R. L. Day, New York, N. Y. Paper (excluding newsprint) had just about caught up with consumption demand by May, while paperboard production was still below.

SMOOTHER, MORE EVEN FORMATION . . . has resulted from recent improvements to No. 7 machine, Hamersley Mfg. Co., Garfield, N.J. Included in new equipment: Bird save-all and Centri-Screen and Nichols Vorvac system. Further modernization planned during summer vacation shut-down period.

PACKAGING WILL GROW FASTER . . . than the U. S. population, says Smith L. Rairdon, vice pres. (marketing administration), Owens-Illinois. Money spent for containers of all kinds will rise from the \$11 billion of 1959 to at least \$18 billion by 1970. Corrugated and solid fiber shipments should increase to \$2.73 billion in the decade.

250,000 ACRES . . . of Wisconsin forest land are now producing under management plans drawn up by Trees for Tomorrow Inc. Says president Folke Becker: "There is a definite trend from merely planting trees to managing land and harvesting under technical guidance" . . . More Forestry News—British Columbia government has at long last granted a tree farm license to MacMillan, Bloedel & Powell River Ltd. covering about 765,000 acres on northern Vancouver Is., the mainland and the Queen Charlotte Is. Originally, application was strenuously opposed by various firms and independent operators who claimed their interests jeopardized.

RECORD SALES AND EARNINGS . . . reported by Scott Paper Co. for the quarter ending July 2. Earnings stood at \$6,725,075, up from the \$6,026,582 for the same quarter a year ago. Said President Thomas B. McCabe: The achievement is "all the more significant in view of the intensely competitive market. The record to date makes us confident that 1960 will be the finest in Scott history."

DEEP SOUTH DEVELOPMENTS . . . Southern Land, Timber & Pulp considers mill site in southwestern Georgia, some 60 miles south of Columbus. Law Engineering Co., Atlanta, is conducting evaluation. . . . Dixie Land & Timber will build in Alabama near Phoenix City. \$30,000,000 pulp and paper mill will produce kraft and linerboard, is expected to be in operation early next year.

NEWSPRINT: SIX-MONTH RECORD . . . North American production through June stood at 4,334,596 tons, 6.6% above same 1959 period. U. S. was up 4.5%, Canada 7.2%.

... Fluid Power news

**REPORT
NO. 12,107
HYTAC®
AIDS MAKING
OF NEW
EXTENSIBLE
PAPER**

From Oilgear Application-Engineering Files

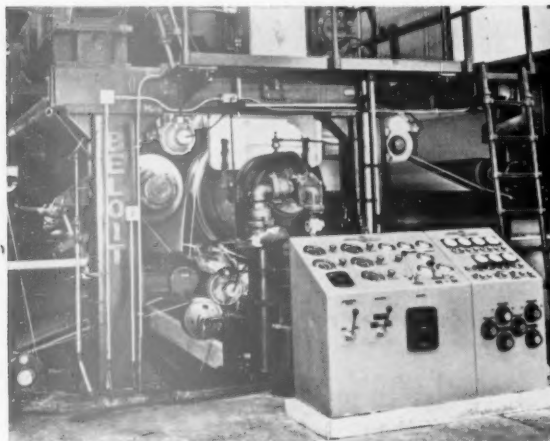
HOW HYTAC® SYSTEMS CONTROL NEW EXTENSIBLE PAPER MACHINE SECTION SPEEDS IN 12 MILLS

USERS: Twelve Paper Companies—Licensed by CLUPAK, INC.

Builder—Sections and Differential Drives—Beloit Iron Works, Beloit, Wisconsin

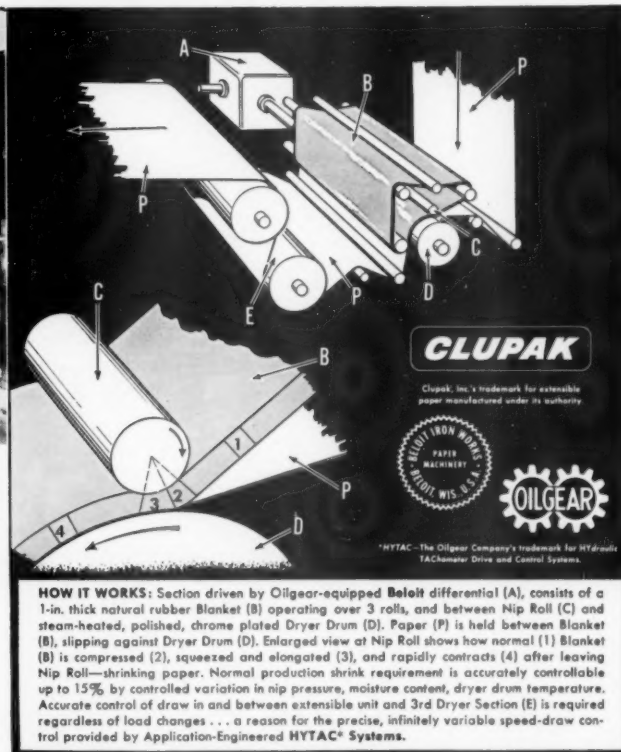
DATA: Systems to vary and precisely control speed and draw of new sections that can be an integral part of complete, new paper machines, or inserted into existing machines for production of CLUPAK® extensible paper—a revolutionary, patented, smooth, tough, kraft sheet. Original requirements called for systems that, when applied to Beloit mechanical differentials, would: 1. Provide precision-controlled, infinitely variable section speed decrease up to 10% under main lineshaft speed—as selected from remote pushbutton stations. 2. Maintain selected section

speed within $\pm 0.25\%$ max. variation over a 50% load change at max. lineshaft speed. 3. Be: compact; impervious to heat, high humidity; thrifty on electrical power input, wiring, installation downtime, floor space; completely free, if possible, from maintenance-provoking belts, chains, relays. 4. Insure trouble-free, continuous, heavy-duty, full-production paper machine drive service—but permit section immobilization for production of non-extensible stock. 5. One source and responsibility for these speed and draw controls preferred.



One of the most recent of the twelve new Beloit extensible sections and control consoles incorporating HYTAC® SYSTEMS for precise speed and draw control—as installed on No. 1 machine at International Paper Company's Southern Kraft Division Mill, Camden, Arkansas, to produce CLUPAK® extensible paper. Control console instrumentation includes direct-reading hydraulic pressure gauges from the OILGEAR System to provide operators with constant, visual, exact indication of load or draw on the section.

SOLUTION: Application-Engineered HYTAC® (HYdraulic TACHometer) controlled differential drives consisting of Oilgear "DRT-3517" Variable Displacement Pumps, "H-6017" Constant Displacement Motors, and HYTAC® components with remote pushbutton control to provide precise speed-draw control on Beloit extensible sections installed and commercially producing CLUPAK® extensible paper at nine mills in the United States, two in Canada, and one in Sweden. Several other paper manufacturers licensed by CLUPAK, Inc., to produce extensible paper under its authority, now have these Oilgear-equipped Beloit extensible sections on order. Oilgear HYTAC® Drive-Control Systems were selected after 3 years of development on this process and machine—from a 2-in. table model, through a 15-in. laboratory model, and a 60-in. pilot model—as best suited to provide the accuracy and range of control required for the variable speed drives. Actual commercial operation has proved that these highly accurate, compact, heavy-duty, Oilgear Systems can maintain any selected section speed with less than $\pm 0.25\%$ variation regardless of load change over a 10:1 range of lineshaft rpm—plus enabling operators to infinitely vary each section's drive rpm up to 15% under main lineshaft rpm . . . exceeding originally specified requirements!



HOW IT WORKS: Section driven by Oilgear-equipped Beloit differential (A), consists of a 1-in. thick natural rubber Blanket (B) operating over 3 rolls, and between Nip Roll (C) and steam-heated, polished, chrome plated Dryer Drum (D). Paper (P) is held between Blanket (B), slipping against Dryer Drum (D). Enlarged view at Nip Roll shows how normal (1) Blanket (B) is compressed (2), squeezed and elongated (3), and rapidly contracts (4) after leaving Nip Roll—shrinking paper. Normal production shrink requirement is accurately controllable up to 15% by controlled variation in nip pressure, moisture content, dryer drum temperature. Accurate control of draw in and between extensible unit and 3rd Dryer Section (E) is required regardless of load changes . . . a reason for the precise, infinitely variable speed-draw control provided by Application-Engineered HYTAC® Systems.

Other inherent Oilgear "Any-Speed" Drive features are: cushioned, controlled starting, acceleration, deceleration, braking . . . positive, automatic overload protection . . . continuously filtered pressure and flood lubrication. Copies of Oilgear's *Fluid Power NEWS* 3, 5, 8, 9, 11—with detailed descriptions of some of these and other Application-Proved installations are available on request.

For practical solutions to your linear or rotary Controlled Motion problems, call the factory-trained Oilgear Application-Engineer in your vicinity. Or write, stating your specific requirements, directly to . . .

THE OILGEAR COMPANY

Application-Engineered Controlled Motion Systems

1592 WEST PIERCE STREET • MILWAUKEE 4, WISCONSIN

Phone: Mitchell 5-6715 . . . Direct Distance Dialing Code 414

MONTHLY REPORT – WORLD NEWS

MANY APPLICATIONS IN CONVERTING . . . is claimed by St. Regis Paper Co. for a new development in rapidly-expanding field of paper and plastic combinations. Under Patent No. 2,917,217, a flexible sheet of foam styrene is bonded to a flexible sheet of paper or other material. First licensee under the patent is granted to Lily-Tulip Cup Corp. Inexpensive combination is said to provide material that is "waterproof, greaseproof, has a high thermal insulation factor and is chemically inert and non-abrasive."

THE CHANGING RIVER . . . Because the Red River frequently changes course, Anglo-Southern Paper Corp. has been granted two permits for construction of its projected \$50,000,000 paper mill—one in Texas, the other in Arkansas.

DEMAND FOR FIBER BOXES . . . this year will be 4% above 1959 shipments, and during the first half of 1961 they are expected to enjoy a 9 1/2% gain over the level of shipments in the first six months of 1960. This according to Peter W. Hoguet, president of the Econometric Institute.

SULFITE LIQUOR RESEARCH . . . for stream improvement will be stepped up 17%, say top executives of the industry. Attending a special exec. committee meeting of the Sulphite Pulp Manufacturers' Research League in Wausau, Wis., they set the research budget of the League at \$185,465 for the fiscal year, up more than \$25,000 from actual expenditures during the past fiscal year. . . . More Stream Improvement News—A ton per day of forest-origin materials formerly lost into the Menominee River at the pulp mill of Marinette (Wis.) Paper Co. is now kept out of the stream and reworked into useful form.

HOPSCOTCHING THE NORTH AMERICAN INDUSTRY — — Southern Pine Lumber Co., Diboll, Texas, will build a particle board plant at Pineland to produce an initial 26,000 sq. ft. annually . . . Dennison Mfg. Co. will build a manufacturing

building at its Framingham, Mass. headquarters to add 62,000 sq. ft. to present facilities. . . . Oxford Paper Co. has sold to the Province of Nova Scotia for approximately \$3,750,000 a total of 396,000 acres of leasehold and some 12,000 acres of freehold timberlands at Cape Breton. . . . Construction to result in 50% expansion has been announced at the Lexington, Ky. plant of the Dixie Cup div., American Can Co. . . . Wisconsin Tissue Mills, Menasha, Wis., is putting up structure to house its Printed Specialty Products div. that will provide additional 30,000 sq. ft. of converting space. . . . Interstate Container Corp., Glendale (L. I.), N. Y. producer of corrugated containers, has acquired Guilford Folding Box Co., Baltimore, Md. . . . Scott Paper Co., Chester, Pa., will take steps toward establishment of an independent institute to improve technology in marketing.

MORE ON THE INDUSTRY . . . Respective boards have approved merger of Lassiter Corp., Charlotte, N. C. converter, into Riegel Paper Corp. . . . Acquisition of Columbia Container Corp. (Baltimore, Md.) and an affiliate, Columbia Container Corp. of Virginia, has been announced by St. Joe Paper Co., Jacksonville, Fla. . . . The "world's largest plastic laminating press" has been put into operation by Consoweld Corp., Wisconsin Rapids, Wis. subsidiary of Consolidated Water Power & Paper Co. . . . Construction progress steadily continues on the 500-ton kraft pulp and linerboard mill being built at Counce, Tenn., by Tennessee River Pulp & Paper Co.; contractor: M. W. Kellogg Co., New York, N. Y. engineering firm. . . . Arborite Co., subsidiary of Howard Smith Paper Mills Ltd., has installed a high-pressure laminating press at its LaSalle, Que. plant. . . . American Can Co. will enter the glass container manufacturing industry. . . . Accurate Corrugated Specialty Corp. and Arrow Board Corp., Los Angeles subsidiaries of Southwest Forest Industries Inc. (Phoenix, Ariz.), have been combined with SFI's Glendale, Ariz. corrugating plant as the Container div. of the parent firm.

SIMONDS SPECIALIZED CHIPPER SERVICE



CAN HELP YOU INCREASE YOUR CHIP YIELD



It is
available
to you
at no charge
call us
today

Simonds Specialized Chipper Service has helped mills all over the country to increase their clean-cut, unbruised chip yield to a maximum. To reduce dust, irregulars and bruised chips to a minimum.

The results have been so astounding that many mills have formed the regular habit of consulting our Specialized Chipper Service people first, whenever they have a chip problem. Here are some typical result-stories. (Full details on request.)

CHIP YIELD UP 8%

In the Southeast, chip yield was increased 8% in one mill simply by recommending closer tolerance in knife bevel and projection. Result? Annual savings of thousands of dollars in wood costs.

30% INCREASE IN CHIP YIELD

In New England, recommended changes in knife pockets, knife projection and clearance angle at one mill increased acceptable chips by 30% preventing the mill from closing down.

\$50,000 SAVED PER YEAR

Savings of over \$50,000 a year were realized at another mill where suggested changes cut knife grinding time from 168 hours to 40 hours, with a proportionate increase in knife life.

THOUSANDS OF \$\$\$ SAVED

At a large mill in the South, recommended changes in knife settings and machine operation increased acceptable chips a full 2%, making possible an annual saving in wood cost of many thousands of dollars.

MILL NOW AT FULL CAPACITY

Changes in knife projection and bevels at 15 saw mill chippers providing a large Southern Kraft Mill with 30% of its needs, solved the problem of excessive fines and eliminated overs, enabling the mill to operate at full capacity.



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Get your local Simonds Distributor's **TRIPLE S SERVICE** — For Local Stocks — Local Speed — Local Skill

Factory Branches in Boston, Chicago, Shreveport, La., San Francisco and Portland, Ore. • Canadian Factory in Granby, Que. • Simonds Divisions: Simonds Steel Mill, Lockport, New York; Heller Tool Co., Newcomerstown, Ohio; Simonds Abrasive Co., Philadelphia, Pa. and Arvida, Que., Canada

MONTHLY REPORT — WORLD NEWS

50% RISE IN PRODUCTION . . . coupled with a 20% population gain is predicted for the non-Communist world by McCann-Erickson Inc., New York, N. Y. "For the first time in two decades, world production capacity is equal to current demands. This confronts the businessman with intensified competition."

SWEDISH IMPORTS, EXPORTS RISE . . . in first four months of year. Imports were Kr.1.84 billion larger than in same 1959 period, while exports showed a gain of Kr.808,000,000. In exports, pulp, paper and board shipments rose in value by Kr.121,000,000.

PACKAGING MATERIALS . . . will be produced by the Paper Products div. of Bowater Packaging Ltd. at "one of the most modern plants of its kind in England." The Gillingham, Kent facility will come into operation about mid-1961.

NEW SULFATE MILL FOR FINLAND . . . where Oy Wilh. Schauman AB will build a plant at Jakobstad. Total annual output—90,000 tons chemical pulp—will be converted into kraft paper at an adjacent paper mill. Both plants set for completion in late 1962.

INDIA, AFRICA, BRAZIL . . . offer markets for Swedish papermaking equipment exported by Elof Hansson, Gothenburg. Included are Gwalior Rayon Silk Mfg. (Wvg.) Co. Ltd., India, building the world's first rayon pulp mill using bamboo; Companhia de Cellulose do Ultramar Portugues in Portuguese Angola (Africa), which has ordered a sulfate mill based on eucalyptus with soda recovery plant, and in Brazil, Cellulose Cambara SA at Port Alegre has ordered equipment that will increase capacity for sulfite pulp from Parana pine from 25 to 75 daily tons.

BLEACHING PLANT FOR SWEDISH MILL . . . Stora Kopparbergs AB has ordered a Kamyr continuous bleaching plant for its Skutskar pulp mills. Plant will be designed for daily output of 300 tons 90% bleached sulfate.

"AN AMAZING INCREASE" . . . is how the Assn. of Pulp Consumers Inc., New York, N. Y., describes the fact that during the first five months of 1960 the world's five principal market pulp-producing nations increased exports of sulfite and sulfate paper pulps by 385,660 tons—19.1%. U. S. producers supplied 36% of the increased tonnage, Swedish 26%, Canadian 18%, Finland 16%.

MILL NEARING COMPLETION IN ANGOLA . . . A paper production facility near the port of Lobito in Portuguese Angola, W. Africa, is scheduled for completion about the first of the year. It will have a daily capacity of 40 metric tons wood-pulp and 20 metric tons paper. Wood supply will be from nearby eucalyptus forests.

SHARP RISE IN USE OF MAN-MADE FIBERS . . . dominates a continuous rise in world consumption of all clothing fibers in past decade, according to figures released by the Food & Agriculture Organization of the United Nations.

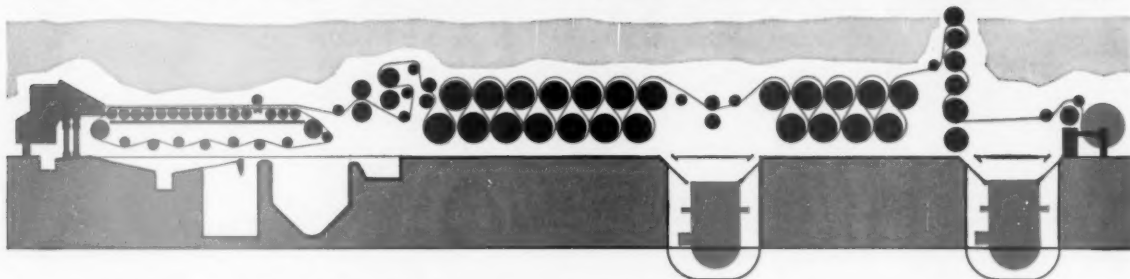
NORTH AMERICA-EUROPE . . . Weyerhaeuser Co., Tacoma, Wash., and Intermills SA of Brussels, Belgium, announce formation of a new European firm, Weyerhaeuser Belgium SA, for manufacture of corrugated shipping containers. (Intermills is a group of leading paper manufacturers operating six mills in Belgium.) New firm will construct plant at Ghlin.

RIISING PRODUCTION AND EARNINGS . . . say reliable reports, have resulted in offers from major U. S. and Canadian companies to purchase Bathurst Power & Paper Co. Ltd., New Brunswick producer of pulp and linerboard.

"IMPROVED IN RECENT MONTHS" . . . is description of market for newsprint, fine and printing papers by Abitibi Power & Paper Co. Ltd., Canadian firm whose net first-half sales were \$71,167,792, up from the \$64,952,813 of 1959. Net earnings were at \$6,054,403, as contrasted to the \$5,320,524 of like period the year before.

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FOR GREATER EFFICIENCY, INCREASED TONNAGE



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Continuous double-rotor models available for wider and higher tonnage paper machines.

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All installations individually engineered to customer specifications.

Continuous Pulping Operation—through automatic controls, handling all weights and grades of paper and board, at full machine production rate. In most applications NO separate broke refining necessary.

Wet-Strength Repulping and Defibering—with the efficient rotor blade-attributioning ring action—defibers *all* grades of wet strength in minimum time. Pulping efficiency data available on request.

MORDEN "Slush-Makers"

are used in furnish make-up, broke reclaiming and deinking plants—either continuous or batch operation.

Avail your mill of the facilities and services of Morden—specialists in refining and pulping. Morden consultants and laboratory serve the paper industry the world over.

▶ Around the world the Morden name stands for quality and service in stock preparation equipment.

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information on Morden's complete line of refiners, jordan and pulpers. Learn how they can benefit your operation.



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UNITED STATES REPRESENTATIVES: South: Ivan Kuhns, Atlanta, Georgia
Midwest: Dan B. Chapman, Appleton, Wis. • Northeast: Orton Corporation, Fitchburg, Mass.

Yankee Drying—Sweden

JANSON-HERMINGE, L. *Svensk Papperstidn.* 63, no. 2: 15-23 (Jan. 31, 1960). [Swed.; Engl. and Ger. sum.] Abstr. Bull. I. P. C. 30:1285.

Heat-transfer studies of the drying of paper on the Yankee cylinder are reported, including theoretical formulas developed by the author to study thermal factors affecting the drying process. The dependence of the rate of water evaporation on some of these factors, especially shell thickness and conductivity, ventilation and condition of the ventilating air, is accounted for. Data on the heat-transport capacity of paper and its dependence on paper porosity are presented.

Web Moisture—Finland

RYTI, NILO. *Paperi ja Puu* 42, no. 2:63-8 (Feb. 1960). [Finn.; Engl. sum.] Abstr. Bull. I. P. C. 30:1285.

The automatic control of the drying process in the paper machine is rendered more difficult by the big time lag unavoidably appearing in the control loop. Theoretical examination of paper drying indicates that control difficulties must be expected especially with heavy paper grades. Effective moisture control on a versatile fine paper machine was achieved by cascade control of the steam pressure in conjunction with a hygrometer to measure the dielectric construction of the web. The introduction of a size press improved the uniformity of moisture distribution in the paper web and reduced the danger of blackening (charring) on the calender.

Eucalypts—Argentina

ELLIOT, C. SIBLEY. *Unasylva* 13, no. 3: 118-23 (1959). Abstr. Bull. I. P. C. 30:1293.

Eucalypts were introduced into Argentina a little more than 100 years ago, and the experiment was so successful that the practice of planting them to provide shelter on the windswept plains on the Pampa became widespread. Today, these otherwise almost treeless plains are dotted with clumps and belts of eucalypts, some of them up to 80 years old, up to 50m high and up to 1m in butt diameter. The principal species in these shelterbelts are *Eucalypts globulus*, *E. viminalis*, and *E. rostrata* (*camaldulensis*). Some 10 or 11 years ago, recognition of the possible important part of eucalypts in meeting Argentina's shortage of home-grown timber led to the beginning of extensive planting of those species listed and other species of eucalypts in widely different parts of the country. Observations on the properties and behavior of the timber grown and the usefulness of different species as sawn timber are reported.

Automation—Germany

LAMBECK, KARLHEINZ, *Das Papier* 14, no. 2: 41-51. (Feb., 1960). [Ger.; Engl. and Fr. sum.] Abstr. Bull. I. P. C. 30:1272.

The improvements in product quality and productivity that can be attained by proper planning and application of modern instruments are illustrated, with special regard to automatic stock preparation, control of groundwood bleaching, stock distribution, and regulation of paper machine sectional drives.

Starch Research—U. S. A.

WHISTLER, ROY L., and SPENCER, W. WILLIAM. *Stärke* 12, no. 3:81-85 (March, 1960). [Ger.; Engl. and Fr. sum.] Abstr. Bull. I. P. C. 30: 1276.

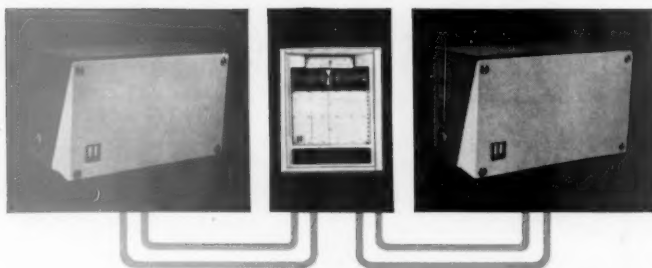
New knowledge on the formation and configuration of cereal starch grains has been gained by electron microscopy, especially on the enzymic synthesis and degradation of starch, in which α - and β -amylases, R-enzyme, Q-enzyme, and phosphorylase play an important role. Economic methods for the separation of amylose and amylopectin have been developed. Experiments on the genetic improvement of corn have led to the cultivation of hybrids containing up to 75% amylose and promise to yield varieties having 90-95% amylose. Many starch derivatives of industrial importance have been developed and merchandised, including low-D.S. starch phosphates and sulfates, oxystarches for paper coating, and starch ethers for use in adhesives and sizing agents.

Fir Deterioration—Canada

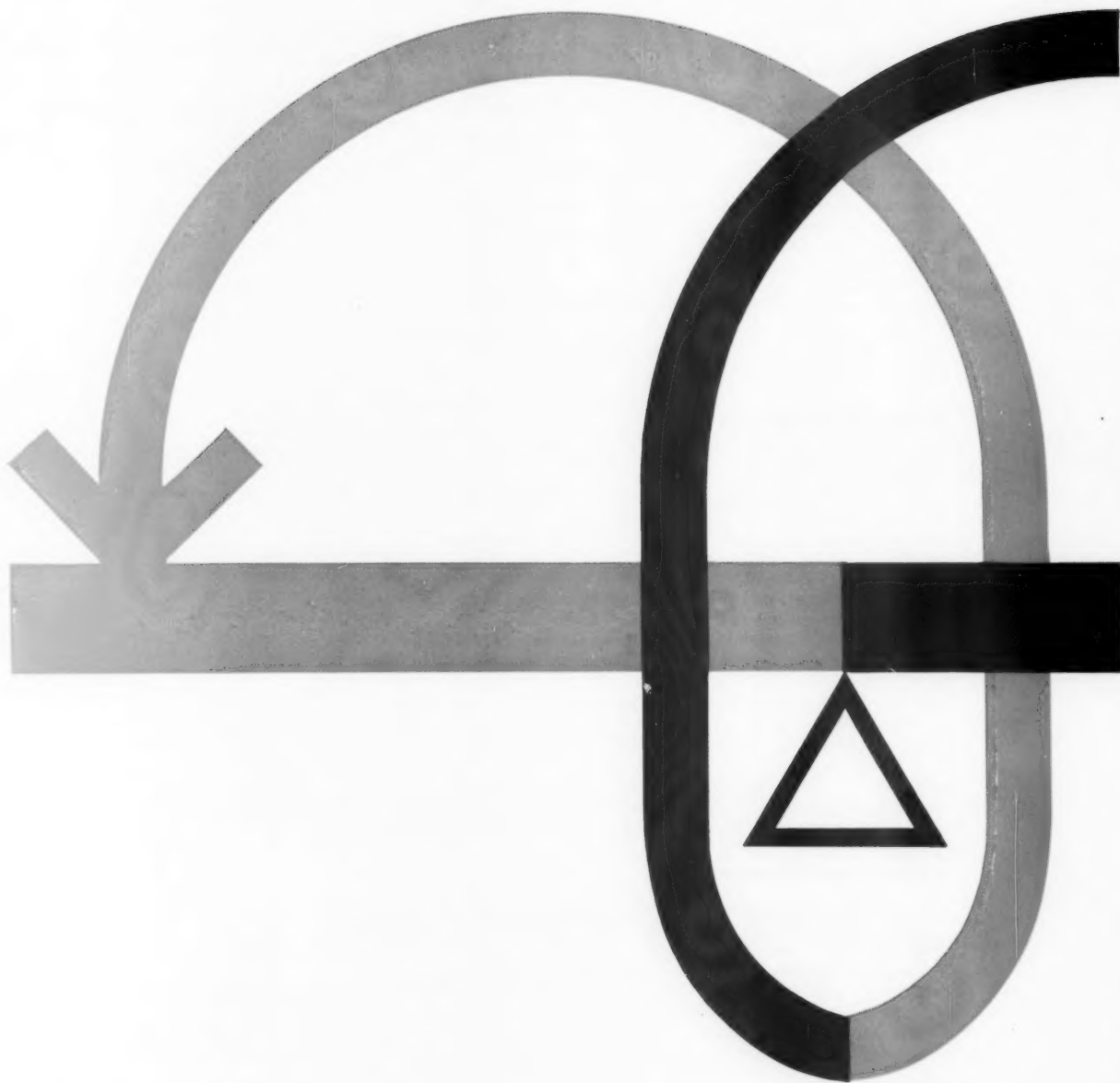
BASHAM, J.T., and BELYEA, R. M., *Forest Sci.* 6, no. 1: 78-96 (March, 1960). Abstr. Bull. I. P. C. 30:1273.

The fungal and insect deterioration of the merchantable portions of balsam fir dying after spruce budworm defoliation was studied. Ten insect species and at least five species of fungi were found to invade the merchantable boles of these trees, altering them in such a way that they become progressively less suitable for utilization. The general pattern of deterioration consisted of a relatively sudden invasion by the insects at or near the time of apparent tree death and a more gradual fungal invasion that completely replaced the insects after two years. Evidence indicates that bark beetles, sawyer beetles and weevils transport certain fungi from dead balsam fir to dying trees or trees that have recently died, and that the development of sap rot is related to sawyer beetle activity. Hence, a close interrelationship was found to exist between the deteriorating insects and fungi. Since insect populations depend on the existence of suitable breeding material, it may be postulated that the rate of tree deterioration would be slower for the first trees to die in otherwise undisturbed forests than in areas where some mortality has already occurred. Although sawyer beetles are the only insects that might alter wood sufficiently to affect the production of pulp, the extent to which these insects are capable of damaging the wood is limited. Fungal deterioration is therefore primarily responsible for the reluctance of most mills to utilize dead trees. Balsam fir salvaged within one year of death will produce pulp with little reduction in yield or quality. If left longer, an appreciable amount of sap rot is encountered, resulting in reductions in the yield and quality of the pulp.

Presented with permission of The Institute of Paper Chemistry, under supervision of Curtis L. Brown, editor of *IPC Bulletin*. Photostats or translations of original reports available at reasonable cost by writing Eugene Bunker, librarian, Institute of Paper Chemistry, PO Box 498, Appleton, Wis., U.S.A.



ElectriK Tel-O-Set—the true 2-wire system

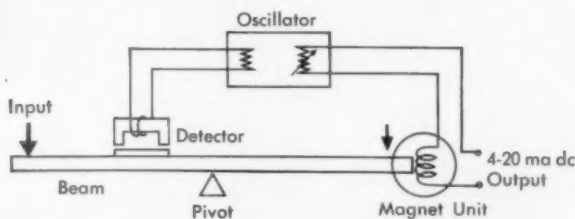


Care and feedback of delicate inputs

Delicate inputs thrive on the tender care of *ElectriK Tel-O-Set's force-balance feedback system*. This system, used as the basic circuit in *Tel-O-Set* transmitters, receivers, controllers, and other instruments, has proved itself in thousands of installations in the last five years. The force-balance feedback circuit increases the accuracy and dynamic response of the system by decreasing hysteresis effects and sensitivity to changes in ambient conditions.

Observe: (1) input force (from bellows, Bourdon tube, or displacement linkage) deflects pivoted beam; (2) air-gap in ferrite detector increases, (3) producing a change in inductance in oscillator circuit; (4) a portion of output current is fed back into magnet unit, producing a force on beam which is equal and opposite to input force; feedback balances beam. Full scale motion is only one-thousandth of an inch.

The advanced control engineering seen in force-balance feedback is carried through the entire *ElectriK Tel-O-Set* System. Specifically, there's no external power required at any field-mounted *Tel-O-Set* instrument. Line power connection is made only at the receiver. Two-wire d-c transmission eliminates shielding problems. The 4-20 milliamp signal range of the system gives a live zero and permits the use of the most reliable transistors available. The d-c signals



can be fed into data handling systems and millivolt-actuated instruments . . . can be easily transduced to a standard 15 psi pneumatic signal to operate existing pneumatic systems.

Take a new look at your control applications with the *ElectriK Tel-O-Set* System in mind! Get complete technical data from your local Honeywell field engineer. Call him today . . . he's as near as your phone. MINNEAPOLIS-HONEYWELL, 21 Penn Street, Fall River, Massachusetts.

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First in Control

SINCE 1885

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PIONEERING THE FUTURE
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PAPER NEWS

from

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Chemical

- *dyes for tinted book papers*
- *new California alum plant*
- *chlorine safety program*
- *super-high-gloss coatings*

• *eye strain eased by new tinted book papers*

colored with Allied Chemical paper dyes

White paper reflects as much as 93-95% of the light — black ink 3%. New color-coordinated papers and inks, like those used in this insert, reflect only about 75% and 10% respectively — sufficient contrast for easy reading *without* fatigue, according to leading color experts.

Cost-conscious manufacturers of tinted papers are using National® "tailor-made" paper dyes. National Paper Dyes give you modern dyestuffs designed for continuous dyeing, dry application and other money-saving techniques. Why not let a National representative show how these dyes can save money for you?

■ **NATIONAL ANILINE DIVISION**



This entire insert is printed on 80 lb. Appleton Coated Impact azure blue; ink is black. Yet, note how your eyes see "highlights" in this picture.



PLANTS:
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 Chillicothe, O.
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 Macon, Ga.
 Marcus Hook, Pa.
 Menasha, Wis.
 Middletown, O.
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 New Orleans, La.
 Pine Bluff, Ark.
 Port Arthur, Ont.
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 Chicago), Calif.
 Savannah, Ga.
 Tacoma, Wash.
 Thorold, Ontario
 Valleyfield, Quebec
 Vancouver, Wash.
 Wisconsin Rapids, Wis.
 And now . . .
 El Segundo, Calif.

• *Allied Chemical adds new unit to network
 of strategically located alum plants*

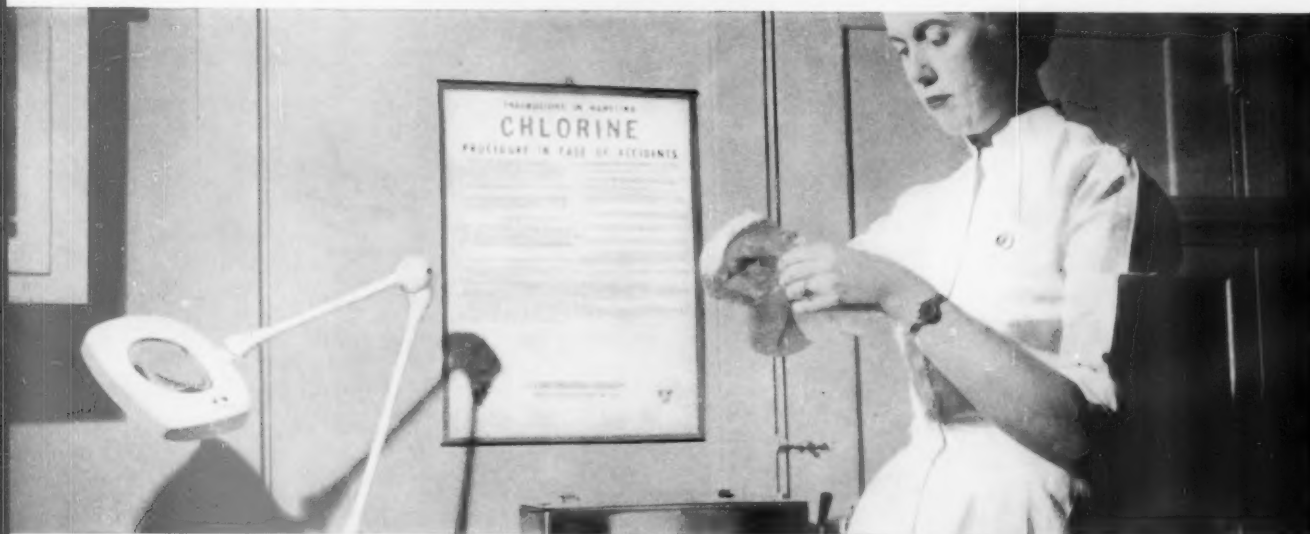
One of America's primary producers of aluminum sulfate, our General Chemical Division has just placed in production its 29th alum plant.

The new facility, situated near Los Angeles, will supply liquid alum — a form of the product pioneered by General Chemical — to paper mills and other consumers in the Southern California area.

Each unit in General Chemical's coast-to-coast network of alum plants is located in the heart of an active consuming area . . . providing paper makers with a close, convenient source of alum, liquid or dry. In addition, General's chain of warehouses makes dry alum immediately available in every major center of commerce. Write or phone for further information on how these facilities can serve you.

■ **GENERAL CHEMICAL DIVISION**

• *how Solvay helps customers with complete chlorin*



Safety posters list precautions to be taken in handling chlorine and procedure in case of accidents. Safety manuals, films and educational literature are also provided.



Solvay provides consultation on chlorine safety facilities and procedures. Here, technical service representative explains use and care of protective clothing.

safety program



Employees clear "danger" area in emergency drill. Safety training of personnel is another important facet of Solvay's integrated safety program for customers.



Equipment from a Solvay Chlorine Emergency Kit being used to stop leakage in tank car dome. Similar kits are available for 150-lb. cylinders and one-ton containers.

Photos on this page show several phases of a typical program in operation at a customer's plant. If you are a user of chlorine, the same service is available to you. Ask for information. ■ **SOLVAY PROCESS DIVISION**

• new super-high-gloss



paperboard coatings now make overwrappings unnecessary



A new heat treatment using A-C Polyethylene developed by Semet-Solvay imparts super high gloss to waxed paperboard...lets you dispense with overwrapping in many cases. It's ideal for frozen food and ice cream packages...butter and oleo...bread wrappers.

You can use this new technique while realizing all the advantages of A-C Polyethylene wax coatings: greater resistance to grease, moisture, scuffing and abrasion...smooth plastic-like feel...positive lock at freezing temperatures...brighter printing effects.

For details on super high gloss with A-C Polyethylene, write us.

■ SEMET-SOLVAY PETROCHEMICAL DIVISION

• *basic to America's progress*



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61 Broadway, New York 6, New York.

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Allied Chemical Canada, Ltd.,
1450 City Councillors Street, Montreal

• *principal products for the paper industry*

BARRETT DIVISION—BARRETT building materials.

GENERAL CHEMICAL DIVISION—Aluminum sulfate; Glauber's salt; Salt cake; Sodium silicate; Sulfuric acid.

NATIONAL ANILINE DIVISION—Adipic acid; CAPROLAN polyamide fiber; Fumaric acid; HARMON pigments for printing inks; Maleic anhydride; NACCONATE diisocyanates (in coatings); NACCONOL detergents and emulsifiers; NACCOTAN dispersing agent and mordant; NADONE cyclohexanone; NATIONAL paper dyes; Phthalic anhydride.

NITROGEN DIVISION—Ammonia liquor; Anhydrous ammonia; Formaldehyde;

Methanol; Polyethylene glycol; Triethanolamine; U. F. Concentrate-85; Urea.

PLASTICS AND COAL CHEMICALS DIVISION—CUMAR resins; ELASTEX plasticizers; Fiber pitch; PLASKON urea resins, Solvents, Tar acids.

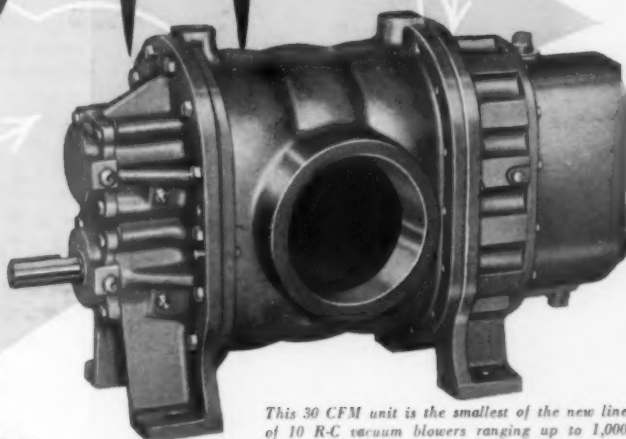
SEMET-SOLVAY DIVISION—A-C polyethylenes—Emulsifiable for paper size or coating; hot melt low molecular weight for coatings.

SOLVAY PROCESS DIVISION — Ammonium bicarbonate; Calcium chloride; Caustic soda; Chlorine; Hydrogen peroxide; MUTUAL salt cake; Soda ash.

INTERNATIONAL DIVISION—Marketing Allied Chemical products abroad.

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vacuum
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as low as
30 CFM...



This 30 CFM unit is the smallest of the new line of 10 R-C vacuum blowers ranging up to 1,000 CFM. They bring the total selection of Roots blowers to 46 sizes...with savings for you in every size.

A BIG SELECTION OF SMALL **ROOTS** VACUUM BLOWERS

Roots-Connorsville adds 10 small-volume vacuum pumps to its already extensive line to give you better selection, better performance in limited-volume applications. This new line is designed to handle capacities ranging from 30 CFM to 1,000 CFM, for operation at up to 20 inches mercury vacuum in single stage construction. These units are designed for compounding for higher vacuum service.

Major features of the larger Roots water-sealed units are retained: simple, efficient design without internal

valves, no internal contact between moving parts, normal maintenance limited to oil changes, efficient operating speeds and minimum sealing water requirements. The result is more CFM per dollar.

Only Roots-Connorsville offers exclusive rotary positive design and such ease of installation in vacuum blowers of this size. They are now available for a wide variety of application in the food, chemical, petroleum, paper, sewage and industrial waste treatment, mining and other industries.

Your nearest Roots-Connorsville sales engineer has full details on this new series of vacuum blowers.

Or write for a specification sheet and for Bulletin VP-158 covering the larger units.

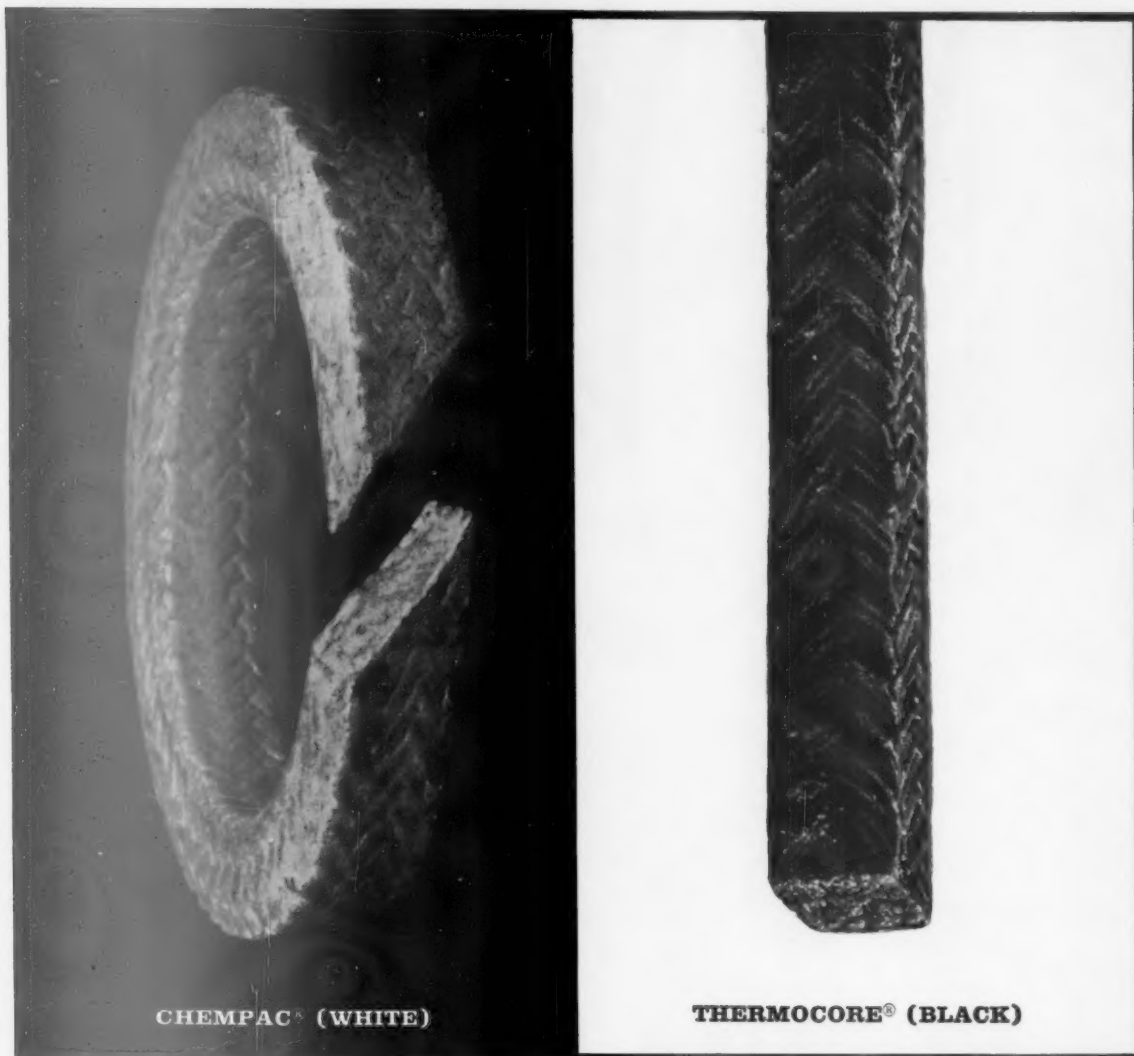


ROOTS-CONNORSVILLE BLOWER

DIVISION OF DRESSER INDUSTRIES, INC.

960 Willow Ave., Connorsville, Indiana. In Canada—629 Adelaide St., W., Toronto





Now—just two J-M styles will handle 9 out of 10 mechanical packing problems!

LET VERSATILE "BLACK" OR "WHITE" HELP YOU REDUCE PACKINGS INVENTORY

Of Johns-Manville's many packing styles, two stand out as "all-purpose" packings. One is for pumps, the other for valves. These two packings not only do an outstanding sealing job . . . they also simplify your packings inventory investment to a minimum.

In 9 out of 10 cases, CHEMPAC and THERMOCORE will handle any pump or valve job in your plant!

CHEMPAC (white) combines the excellent sealing and heat-resistant qualities of asbestos . . . with Teflon's immunity to almost all chemical and solvent action. Chempac Style 2009 will give outstanding service on pumps, expansion joints and agitators.

THERMOCORE (black) consists of asbestos yarns, reinforced with Inconel wire . . . braided over a plastic core

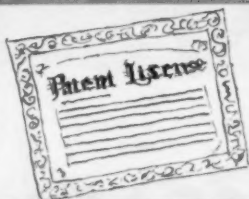
of graphite and 100% white asbestos. It remains stable even in valves where line temperatures run as high as 1200 F . . . adapts readily to eccentric motion. Thermocore Style 397 is recommended as the "universal" valve packing.

Johns-Manville produces the industry's most complete range of packing styles. These are described in a new 64-page Mechanical Packings book—the most complete of its kind. In its handy pages, you will find answers to the correct selection of packings best suited to each particular requirement.

For full information on "WHITE" and "BLACK," see your J-M Distributor . . . or write to Johns-Manville, Box 14, New York 16, N. Y. In Canada: Port Credit, Ont.

JOHNS-MANVILLE 

Which of these 3 products and services can you use from BECCO?



"Enclosing \$1.00 — Send Patent License"

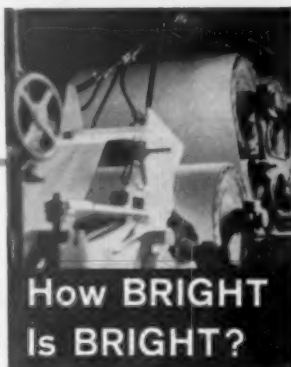
Well, perhaps there's a little more to your gaining use of Becco patents than just mailing your dollar in, but not much more. And certainly, no more money. The \$1.00 really does cover it.

Becco has lots of patents, granted as a result of innovations in the use of Hydrogen Peroxide and other Peroxygen chemicals developed in Becco's Research Laboratories. But they don't do us a whole lot of good locked tightly in our safe. So, we long ago adopted the following policy:

If one of our patents can help you, we'll be glad to license the rights to you **perpetually**, for just one dollar. You get a nice certificate, incidentally, to cover the legalities, but more important — you also get free our complete engineering help in setting up your process, handling the material, maintenance, etc., etc.

What do we get? You as a customer — we hope — but there's no obligation on your part. Just seems to work out that way, though — when we know enough about a particular peroxygen to hold a patent on its use, chances are we've also learned enough to produce it purer than anyone else. You benefit from this; we do, too.

Use the coupon below to ask for a Sales Engineer — or our list of patents — that may help you solve an important problem.



How BRIGHT Is BRIGHT?

That's a hard question to answer. It depends on how the pulp is treated.

Trouble is, paper can show an 86 level at the layboy, but by the time the paper is delivered, this has dropped to 82 or lower. With conventional bleaching methods, that is.

Many chemical pulp producers have found the answer to this problem in Becco's Dryer Steep Bleaching Process (patented, but licensed perpetually for one buck). Applied by means of spray pipes across the pulp sheet ahead of the dryers, Becco Hydrogen Peroxide increases brightness permanence and bleaches in transit. Often, in fact, an 86 layboy level improves to 88 by delivery time.

This is just one example. Becco has a vast amount of technical knowledge compiled from 31 years of experience with all types of pulp. If you'd like help with your pulp, free of any obligation, let us know with the coupon below.

Problems in handling Hydrogen Peroxide



Becco's Four-Fold Engineering Service Program — offered free — includes:

1. Comprehensive survey of your facilities.
2. Specific proposal with recommendation of proved equipment and where it is obtainable.
3. Installation supervision by Becco.
4. Periodic inspection and permanent service.

Can you use this free Becco help, based on more years of experience with bulk handling of H_2O_2 than any other manufacturer? Use the coupon to let us know.

BECCO



BECCO CHEMICAL DIVISION, FMC
161 East 42nd St., New York 17, N.Y.
Dept. PP-F

Gentlemen:
Please send your list of patents available on the use of

- ☐ Hydrogen Peroxide
☐ Peroxygen Chemicals
☐ Persulfate Chemicals
☐ Please have a Sales Engineer call.

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FIRM _____
ADDRESS _____
CITY _____
ZONE _____ STATE _____

BECCO



BECCO CHEMICAL DIVISION, FMC
161 East 42nd St., New York 17, N.Y.
Dept. PP-C

Gentlemen:
We would like help with our pulp. Please have a Becco Sales Engineer call.

NAME _____
FIRM _____
ADDRESS _____
CITY _____
ZONE _____ STATE _____

BECCO



BECCO CHEMICAL DIVISION, FMC
161 East 42nd St., New York 17, N.Y.
Dept. PP-B

Gentlemen:
Please tell me more about your Four-Fold Engineering Service.

NAME _____
FIRM _____
ADDRESS _____
CITY _____
ZONE _____ STATE _____

CLINTON customized dextrins

...formulated to fit your specific application
...with unvarying uniformity!



*Clinton Corn Research Center ...
starting point of your customized dextrins.*

You get what you want and need—made to your specifications and designed to solve individual adhesive problems in your plant—when you get together with Clinton. And once you decide on a Clinton dextrin or combination, a whole area of worry disappears for you. Because you're *sure* of getting the same uniform quality from then on . . . no matter how large the *quantity* you order.

A Clinton Technical Sales Representative welcomes the opportunity to be of service to you. If you have a dextrin problem, your local Clinton Man will be happy to arrange a meeting.

CLINTON CUSTOMIZED DEXTRINS FOR PAPER APPLICATIONS

Use them for ...

Coating • Laminating • Bag Adhesives
Spiral Tube Winding
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Envelope Adhesives • Animal Glue Extenders
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...improving products from corn for over 50 years

CLINTON CORN PROCESSING COMPANY

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Service FROM FIVE TEXTILE PAPER PRODUCTS PLANTS



NOW YOU'RE IN EASY REACH for quick deliveries of paper cores from Textile Paper Products. Check our locations above, consider the fact we use our own fleet of trucks, you'll see you can depend on Textile Paper Products for fast sure deliveries.

BUT FAST SERVICE IS NOT ALL! You get more crush resistance per dollar from our "Ironfibre" cores than you've ever known, and Textile Paper Products can fully supply you with machinery to solve all core-room problems.

Your best source for Paper Mill Cores, Cellophane Cores, Free Film Cores and Camelback Shells. Also supplies for Textile Mills.



TEXTILE PAPER PRODUCTS, Inc.

HOME OFFICE: CEDARTOWN, GA. • **PLANTS:** CROSSETT, ARK.; BOGALUSA, LA.; JACKSONVILLE, FLA.; CARLYLE, ILL.



100- or 150-lb. cylinders with I. C. C. approved valves or one-ton containers in 6, 8 or 10-ton lots on special trucks.

by truck



100- or 150-lb. cylinders; one-ton containers in 15-ton multi-unit tank cars; single-unit tank cars.

by rail

get liquid chlorine your way

It's the handling and shipping and technical skills that make the big difference in *liquid chlorine*. Diamond is not only one of the largest producers, but delivers chlorine the way that makes you glad you said, "Diamond." Where you want it . . . when you want it . . . as you want it.



Barges with capacity of 600 tons, on America's principal inland waterways, bring big users lowest possible shipping costs.

**by
waterway***

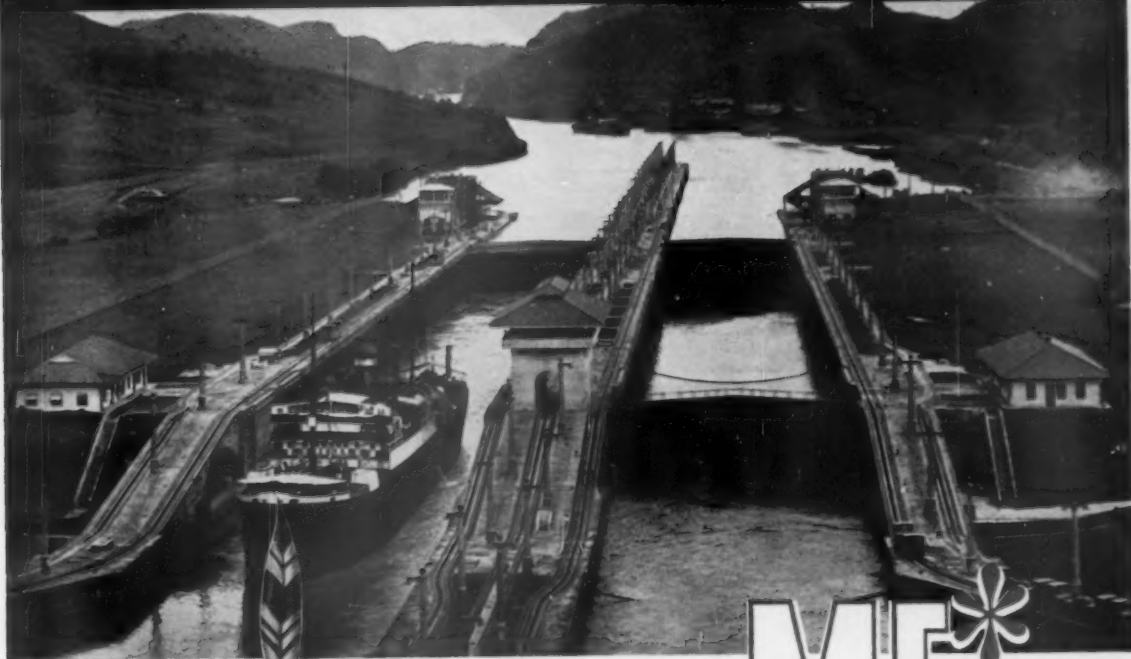
*From plants at Muscle Shoals and Houston



Learn more about getting *liquid chlorine your way*. Send for the "Diamond Chlorine Handbook." Diamond Alkali Company, 300 Union Commerce Bldg., Cleveland 14, Ohio.

Diamond Chemicals

Motors and Generators...that's our Business!



ME^{*}
DID!

During the internationally prominent conversion of the PANAMA CANAL from a 25 to 60 cycle operation, 95% of the electric motor awards were made to ME^{*}. This major contract was awarded on the basis of product quality, delivery and company cooperation. For this outstanding project ME^{*} met the full demands of contracting engineers with 800 motors ranging in size from 1/4 to 700 H. P. . . . designed to critical specifications — delivered and installed on time!

Although this is another feather in the project-studded bonnet of ME^{*} "Injun-eers", our Chief is never satisfied with past won battles, so we'd like to wrestle with your problem during your next project pow-wow. You'll see too . . . What ME^{*} Can Do . . . for you!



This data and specification file on Marathon Electric Motors and Generators is now available for your ready reference use. May we mail you your free copy now?



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TITANOX® helps make a good paper better

Don't misunderstand us. We're not claiming any credit for the editorial content of the New York Times, one of the world's great newspapers.

But we are proud that TITANOX titanium dioxide is being used to brighten the "rainy-day" bags that help the Times reach its subscribers in the most readable condition. It's this white titanium dioxide pigment that gives this waxed-paper stock the whiteness, brightness and opacity that makes the Times' advertising message stand out.

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TITANOX white pigments are always a favorite—not only for overcoming the transparency caused by waxing, but also for opacifying the highest grades of writing and printing papers. Whether added at the beater or in surface applications, TITANOX always makes a good paper better.

And as it is with paper, so it is with a wide range of other products... there is a TITANOX pigment for anything that needs whitening, brightening or opacifying. Titanium Pigment Corp., 111 Broadway, N.Y. 6, N.Y. In Canada: Canadian Titanium Pigments, Ltd., Montreal.

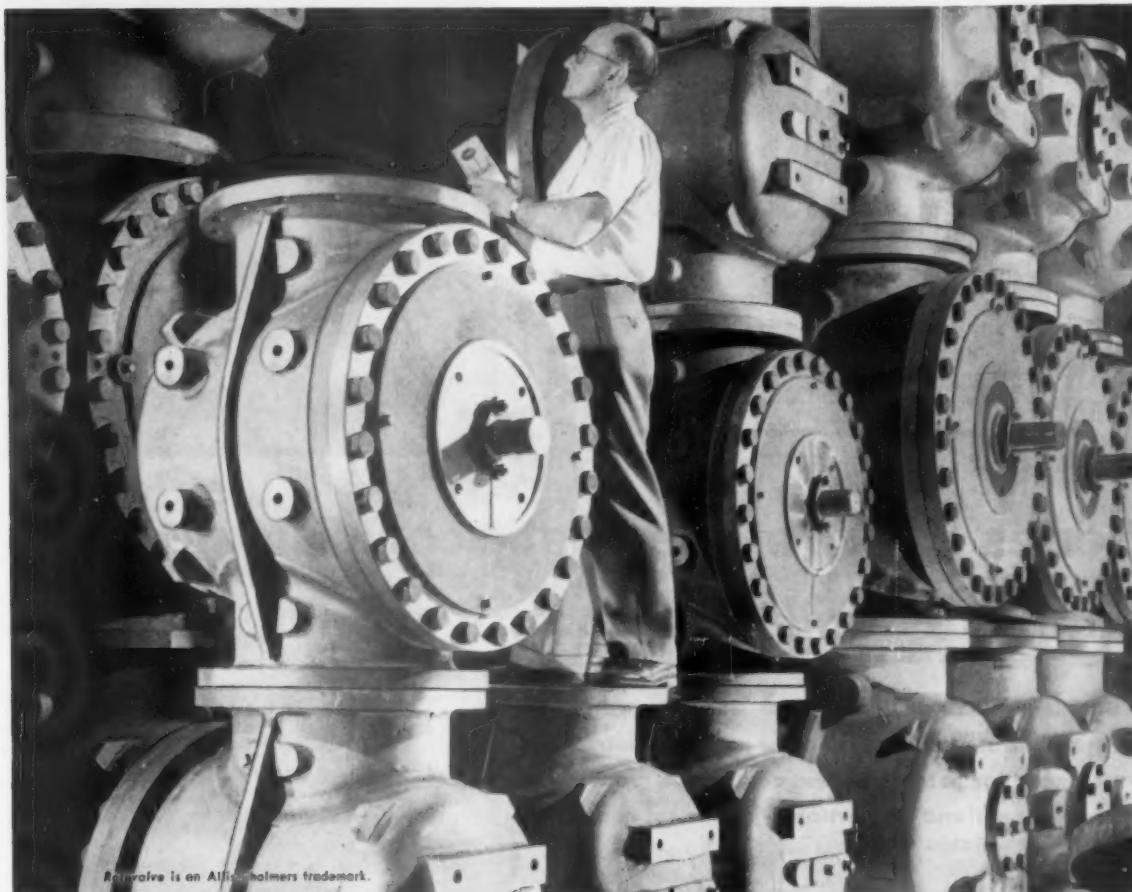
TITANIUM PIGMENT CORPORATION
SUBSIDIARY OF NATIONAL LEAD COMPANY



ALLIS-CHALMERS



A-1260



Rotovalve is an Allis-Chalmers trademark.

ROTOVALVE stocks at A-C York Works save months of delay for customers.

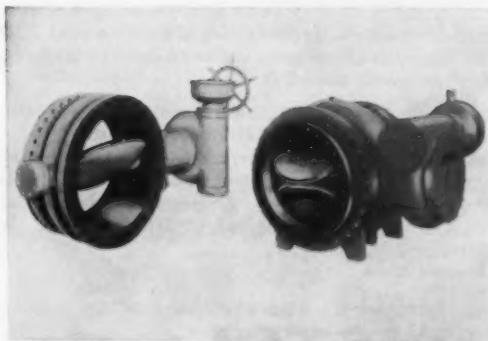
Another Allis-Chalmers time-saving exclusive: **Cone valves "right off the shelf!"**

Six to thirty-inch *Rotovalve* units — awaiting your call. Think of the valuable time you save! Typical is the case of a western municipality that recently needed one 24-inch and three 20-inch *Rotovalve* units for their waterworks. Allis-Chalmers assembled all accessories required, completed testing and shipped the valves to customer in less than three weeks! Compare this with the 3 to 6 months normally required by other suppliers for delivery.

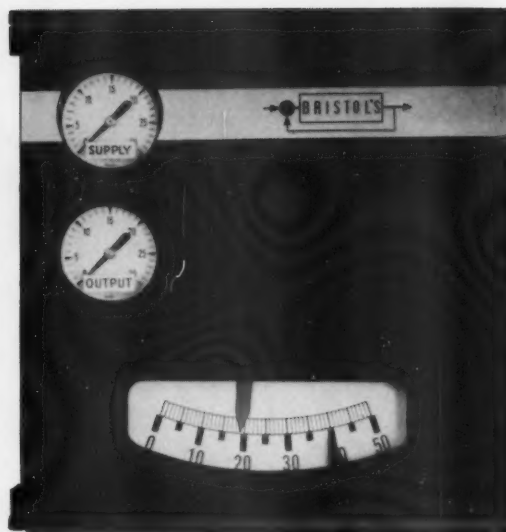
Perpetual off-the-shelf inventory of *Rotovalve* units, butterfly and ball valves gives Allis-Chalmers today's only complete rotary valve-stocking program . . . guarantees fastest deliveries to you.

Avoid troublesome, costly delays and get the valves you need to do the job right. For immediate assistance anytime, call your nearby A-C valve representative, district office or write **Allis-Chalmers**, Hydraulic Division, York, Pa.

Rotovalve is an Allis-Chalmers trademark.



Standard butterfly and ball valves illustrated are also available from stock in a broad range of sizes.



Series 624 A/D* pneumatic controller features simplicity and high control stability

- Simple modular design for ease of servicing
- High control stability for closer process control
- Designed for batch-type and continuous processes
- Proportional and proportional-plus-reset control models available

Top control performance with maximum simplicity plus standard Bristol precision measuring elements—those are the key features of the Bristol Series 624 Controller. The 624 uses the same renowned elements that have earned such a reputation for accuracy and dependability on other Bristol automatic controlling and recording instruments—perfected through wide experience and many years of development.

Self-contained modular design of the control unit speeds servicing. The whole modular unit, consisting of an aluminum casting with working parts made of stainless steel, Ni-Span C, and Neoprene diaphragms, can be removed by taking out only two screws and a link.

Outstandingly compact, the aluminum instrument case (only 8" x 8" x 5" overall) is completely weatherproof. It is designed for either flush, surface, panel, or valve mounting. Attachments for pipe mounting (2-inch pipe) are available. Write for complete data on the versatile and economical 624 A/D. The Bristol Company, 142 Bristol Road, Waterbury 20, Conn.

*Advanced Design

CONTROLLERS OFFERED FOR:

PRESSURE AND VACUUM: Ranges from full vacuum to 10,000 psi.

TEMPERATURE: Ranges from -100°F to +1000°F.

FLOW AND DIFFERENTIAL PRESSURE: With mercury-type manometer and dry-type differential unit.

LIQUID LEVEL: With bulb unit and mercury manometer and dry-type differential unit.

HUMIDITY: Zero to 100% relative humidity.

CONTROL UNIT CHARACTERISTICS:

PROPORTIONAL BAND: 0-400% continuously adjustable, direct- or reverse-acting.

RESET: 0.1 to 50 repeats per minute.

AIR PILOT: Non-bleed type.

PILOT CAPACITY: 3.0 scfm.

FREQUENCY RESPONSE: Flat to 300 cycles per minute.

TEMPERATURE STABILITY: Less than 0.25% change in the output pressure for 90°F temperature change.

MATERIAL: Aluminum housing; 316 stainless steel internal parts; Ni-Span C feedback element.

BRISTOL ... for improved production through measurement and control
AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

**LOCKS 'EM
IN OR OUT
-LONGER**



NEW LATEX FOR COATING
RESYN® 3600
POLYVINYLDENE CHLORIDE

RESYN 3600 is a water dispersed polyvinylidene chloride that promises a revolution in protective coatings. For the first time, it combines exceptional barrier properties with simple low cost application by high speed coating machines or spraying. It offers important new advantages:

MOISTURE—Moisture vapor transmission is $2\frac{1}{2}$ to 5 times lower than that of polyethylene. **ODORS**—Resistance to transmission of common gases 1000-2000 times greater than polyethylene. **CHEMICALS**—Almost complete non-reactivity to

concentrated acids, solvents, alkalis and other corrosive materials. Grease and oil penetration is nil. Fire retardancy is excellent.

RESYN 3600 can be coated on paper, paperboard, plastic and other substrates. It also may be applied to fibers. It is of interest to a broad range of industries, including food and other types of packaging, converting, chemical, and textile.

Experimental lots of **RESYN 3600** are now available. A 14 million lb. plant will be on stream this fall. Write for information.

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*Need supplier
with know-how
Call Marathon*



A DEPENDABLE SOURCE FOR QUALITY CONVERTING MATERIALS

The ablest personnel in the paper business staff Marathon operations in all parts of the country. Mill managers, technicians, woodlands supervisors, engineers—all know their business thoroughly. Their talents are at your service.

Keep Marathon in mind for pulp, printing papers, paperboard and specialty materials.

Pulp, Paper and Paperboard Department

marathon 

A Division of American Can Company

MENASHA, WISCONSIN

"Since we switched to more WISCONSIN WIRES, Tom—
I'm fully relaxed and really enjoy my leisure hours"



WISCONSIN WIRE WORKS
APPLETON • WISCONSIN



HAM FELTZ says:

**"Reminds me of HAMILTON Felts
... Highest Quality!"**



***WIN ... A NEW Shakespeare
Spincast Fishing Outfit!**

"What famous place reminds you of Hamilton Felts? Tell us why in a few words; sign your name and address and name of company. Each month, the idea from a papermaker that we use wins a new 1960 model Shakespeare Spincast Rod and Reel—FREE! When identical winning ideas are submitted by 2 or more papermakers, the one with the earliest postmark will be considered the winner. Every papermaking entrant receives a famous Rex Spoon fishing lure—FREE. Send me your suggestion—today. Ham Feltz, 612 First National Bank Bldg., Cincinnati 2, Ohio."

YOU CAN'T BEAT
Hamilton
FELTS

Rising 555 feet, the graceful Washington Monument towers above all other structures in Washington, D.C.—just as—for quality and efficiency—Hamilton Felts seem to tower above all other felts. Since 1858, papermakers have found that Hamilton Felts give longest quality performance and less broke between change-overs.

"Hamilton Felts are 'water conditioned' to run water like a sieve, deliver drier sheets to the driers, permit operators to run machines at higher speeds with fewer stops."

If one of our 300 modern, technically proven styles won't solve your specific problem, we'll be happy to design a Hamilton Felt that will. Just ask your Hamilton Felt Service Salesman.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

Leadership in Paper Making Chemicals



WHEN SHE'S A GREAT-GRANDMOTHER THIS BOOK WILL BE "LIKE NEW"

Books like "Sleeping Beauty" have been bringing a smile to children's faces for generations. But the casualty rate is high . . . continual reading soon takes its toll and the book must be replaced.

Now there is a way to manufacture book paper that will last as long as 300 years under the conditions of everyday use. This paper was developed by the well-known restorer of documents, W. J. Barrow, under a grant to the Virginia State Library by the Ford Foundation's Council on Library Resources.

Only an alkaline-sizing agent could be used, and Aquapel® sizing agent was the logical choice. Aquapel is more than a conventional paper size. It becomes an integral part of the paper. Since it is on the alkaline side, the paper is stronger and more durable.

Paper Makers Chemical Department

HERCULES POWDER COMPANY

INCORPORATED

900 Market Street, Wilmington, Delaware



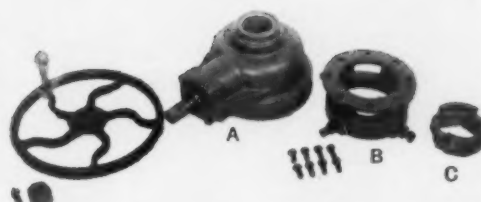
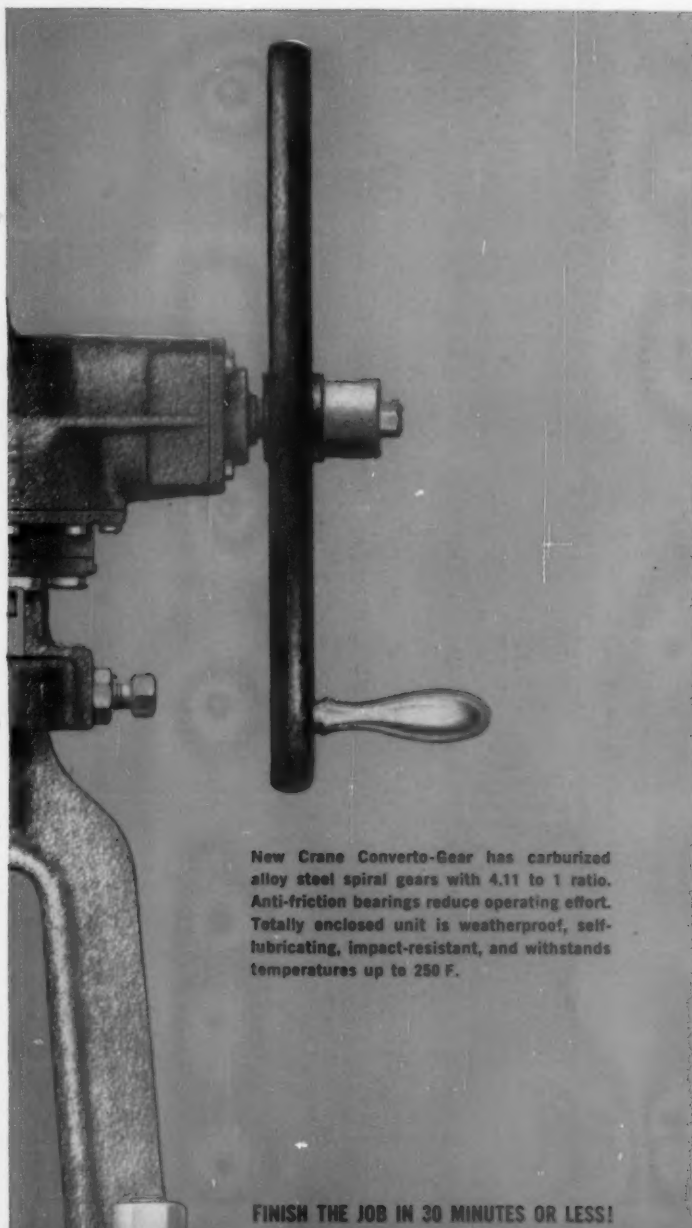
CRANE
DIRECTION '70



... a fast-moving program of planned expansion, product development, and streamlined distribution to help our customers meet the competitive challenges of the Sixties.

**NEW! You can
order this CRANE
Converto-Gear[®]
Valve Operator
from stock...
install it in less
than 30 minutes**





Only three parts needed to convert your OS & Y valve to gear operation: (a) Crane Converto-Gear Operator, (b) adapter for mounting operator on valve, (c) yoke sleeve adapter. Handwheel and mounting bolts furnished with conversion kit.

Now you can convert to rapid, easy gear operation on many of your Crane iron and steel gate valves without removing them from the line! Changeover is simple and fast with Crane's new Converto-Gear Operator.

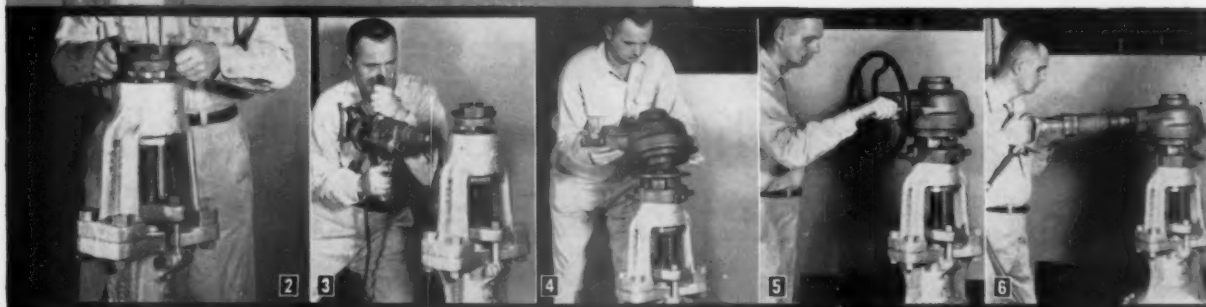
Your Crane Distributor can give you complete information on this brand-new idea in gear operators for gate valves. The Converto-Gear is standard and universal, readily mounted on Crane iron and steel gate valves in sizes from 6-inch to 36-inch, in outside screw and yoke or non-rising stem patterns.

And new orders for gear operated valves can be filled with unprecedented speed because the Converto-Gear can be supplied on valves right from stock. No special yoke castings or brackets are needed . . . just the basic gear operator and a simple two-piece adapter.



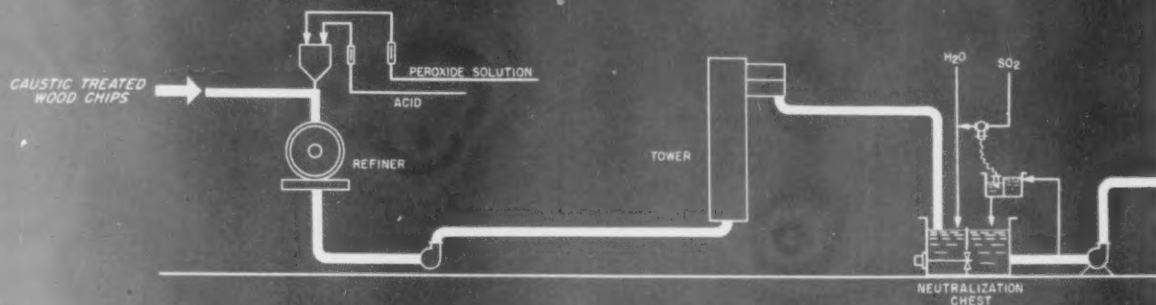
CRANE CO., INDUSTRIAL PRODUCTS GROUP
4100 S. KEDZIE AVE., CHICAGO 32

VALVES • ELECTRONIC CONTROLS • PIPING
PLUMBING • HEATING • AIR CONDITIONING
HEAT EXCHANGERS • CYCLOTHERM® BOILERS

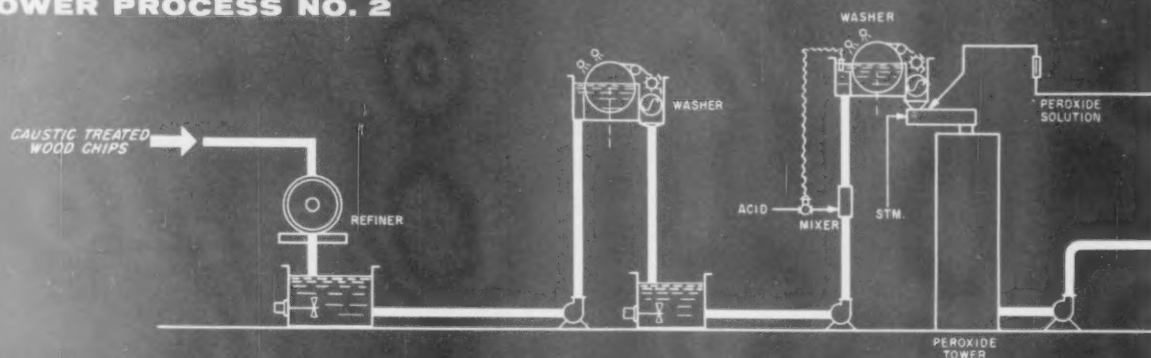


To convert your OS & Y valve, (1) remove the handwheel, (2) mount the yoke sleeve adapter, (3) countersink 4 holes for the Converto-Gear adapter, (4) bolt the adapter in place and attach your Crane Converto-Gear Operator, (5) and you're ready for smooth, manual operation, (6) or fast operation with an air or electric power operator.

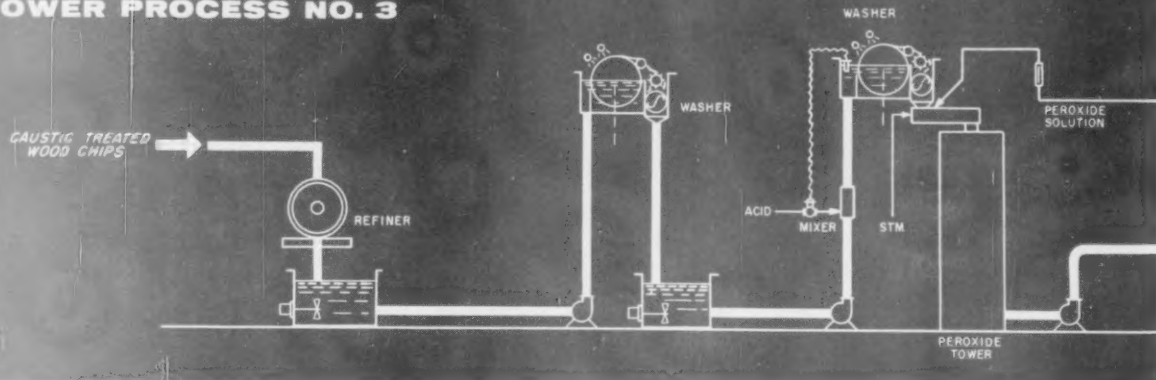
REFINER PROCESS NO. 1



TOWER PROCESS NO. 2

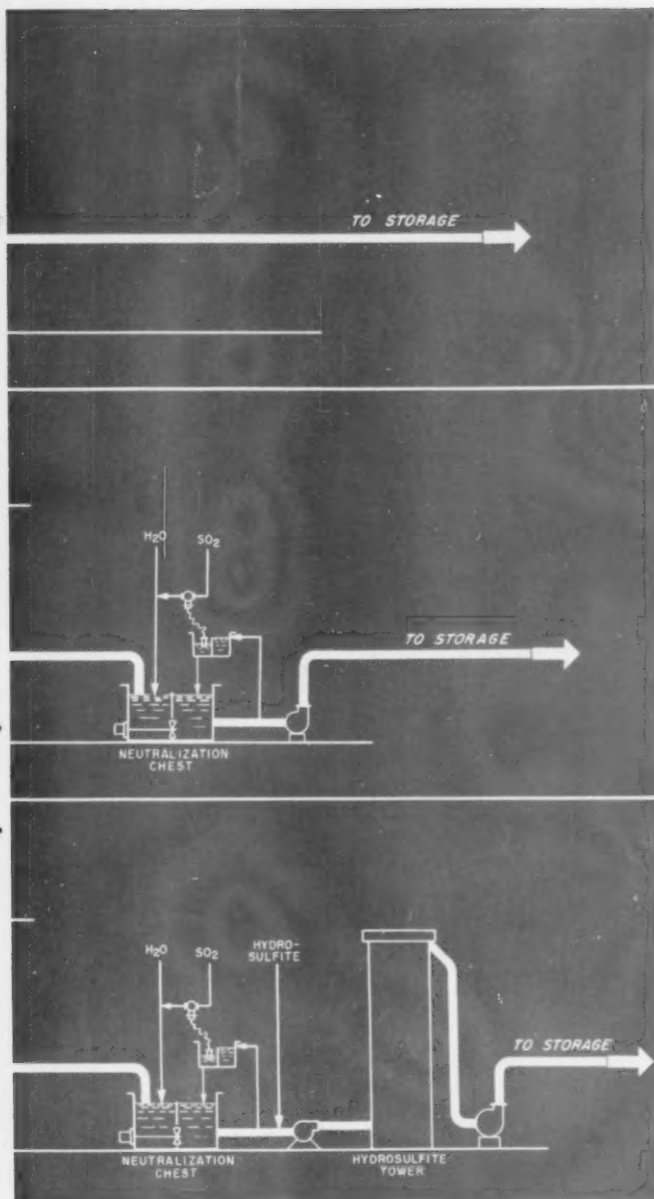


TOWER PROCESS NO. 3



**Which process is best for
experience can help you make the right
...and save you thousands of dollars in**

CALL ONE OF THESE MEN...LET HIM WORK WITH YOU IN MAKING THIS IMPORTANT DECISION:



Du Pont experience has helped many mills make the right choice between tower or refiner bleaching for cold caustic pulp based on brightness requirements. For example:

◀ **60 brightness.** In process No. 1 at left, caustic-treated wood chips enter refiner and are bleached with "Albone" hydrogen peroxide and acid*. The use of acid controls the alkalinity of the bleaching reaction and assures maximum response from the hydrogen peroxide. Sulfur dioxide (SO_2) then neutralizes the bleached pulp and stabilizes the brightness obtained in the refiner. *Du Pont Patent Pending.

◀ **65 to 75 brightness.** In process No. 2 at left, pulp is refined, washed to remove caustic solubles, acidified with sulfuric acid to remove acid solubles, washed, and bleached in a conventional peroxide tower to desired brightness in the 65 to 75 range.

◀ **70 to 80 brightness.** In process No. 3 at left, pulp goes through the same steps as in process No. 2. Then pulp is neutralized, and bleaching is completed in a hydrosulfite tower for maximum brightness in the 70 to 80 range.

*Electrochemicals Department, Peroxygen Products Division
Wilmington 98, Delaware*

ALBONE®
hydrogen peroxide



SOLOZONE®
sodium peroxide

BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY

bleaching cold caustic pulp? Du Pont choice between tower or refiner bleaching investment and chemical costs.

Midwest Area

W. L. Lilke, Chicago, Ill.—INdependence 3-7250

New York & Boston Area

C. R. Lombard, New York, N. Y.—LOngacre 3-6440

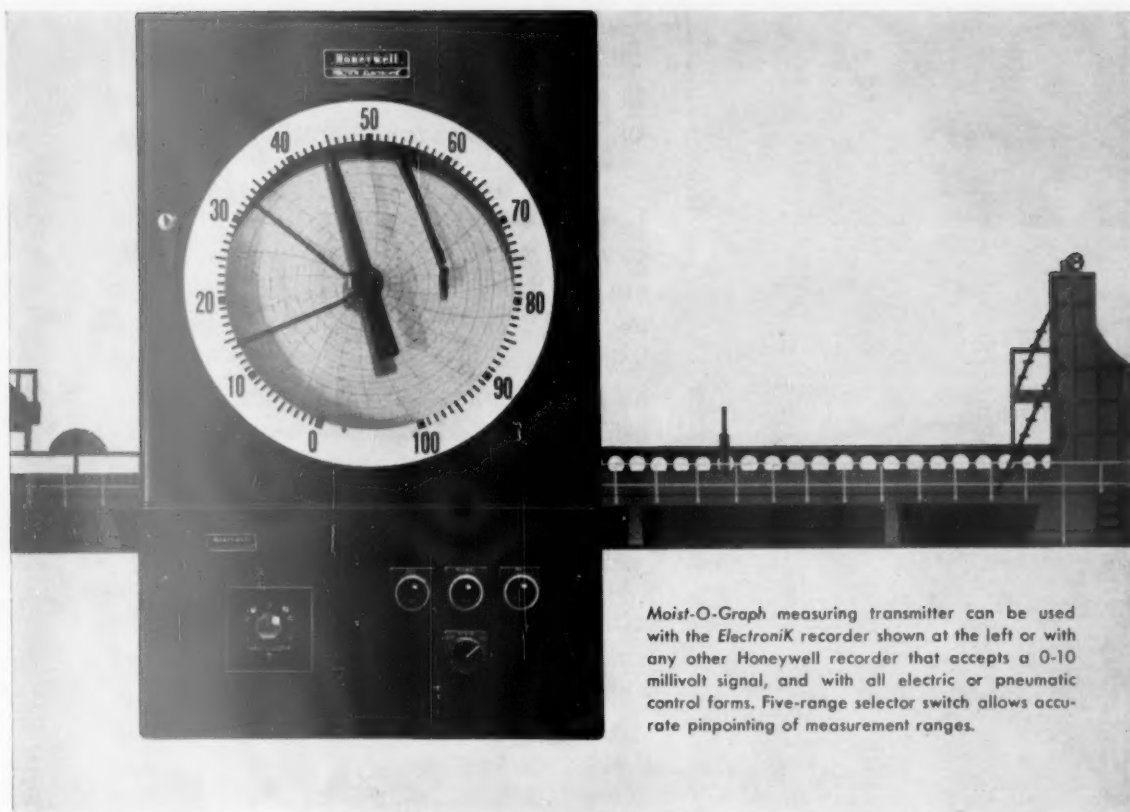
West Coast Area

P. E. Kiefer, Portland, Oregon—CApital 7-1281

Southern Area

R. W. Hammond, Charlotte, N. C.—FRanklin 5-5561

Or call: N. J. Stalter, Wilmington, Delaware—PRospect 4-4698



Moist-O-Graph measuring transmitter can be used with the *ElectroniK* recorder shown at the left or with any other Honeywell recorder that accepts a 0-10 millivolt signal, and with all electric or pneumatic control forms. Five-range selector switch allows accurate pinpointing of measurement ranges.

New MOIST-O-GRAPH IV moisture control system matched to high-speed paper processes

The new *Moist-O-Graph IV* moisture control system features fast control response to meet the requirements of high-speed processing, and flexibility for custom-fitting to your exact requirements.

Heart of the system is the new *Moist-O-Graph* transmitter, which contains the entire measuring circuit, and is compatible with any Honeywell recorder and recorder-controller that accepts a standard 0-10 millivolt signal. This means that you're not limited to one or two types of control. Now you can match your process with any Honeywell control unit, such as *pneumatic* proportional with reset; *electric* proportional position, or proportional current, with reset.

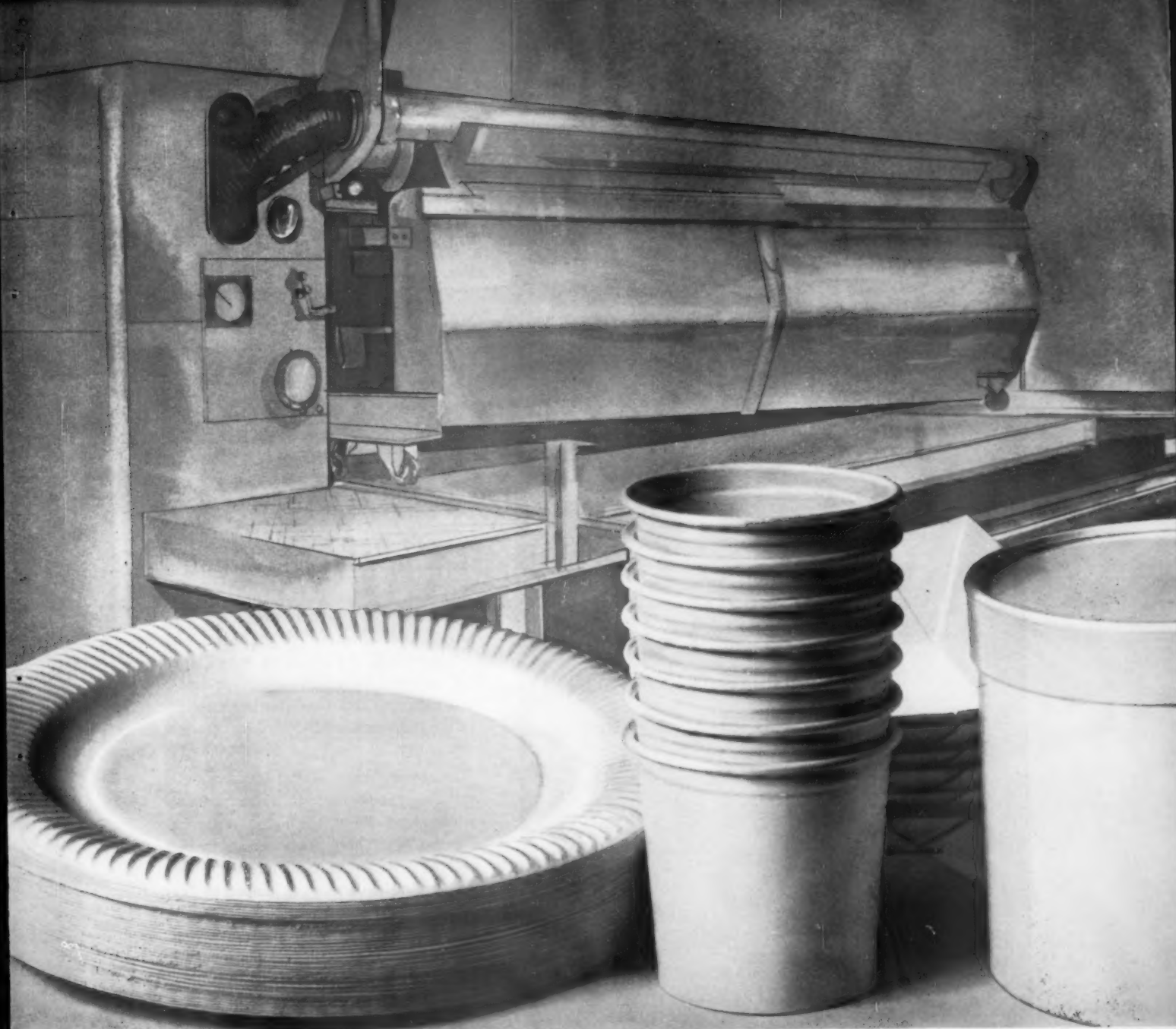
The *Moist-O-Graph* transmitter measures extremely low electrical resistances, and can therefore accurately measure high moisture content—even that of many wet materials. New design features minimize effects of static electricity, so that low moisture content can be measured.

Mount recorders in the *Moist-O-Graph* system anywhere. Modular design and plug-in components make the system easy to maintain. Get complete details from your nearby Honeywell field engineer. Call him today . . . he's as near as your phone.

MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa.—In Canada, Honeywell Controls, Ltd., Toronto 17, Ontario.

75th
PIIONEERING THE FUTURE
YEAR

Honeywell
 *First in Control*
SINCE 1885



LYTRON[®] 6

A new co-polymer latex—exempt from Food Additive Amendment for web coating food board used in throw-away paper cups, plates and other single service containers

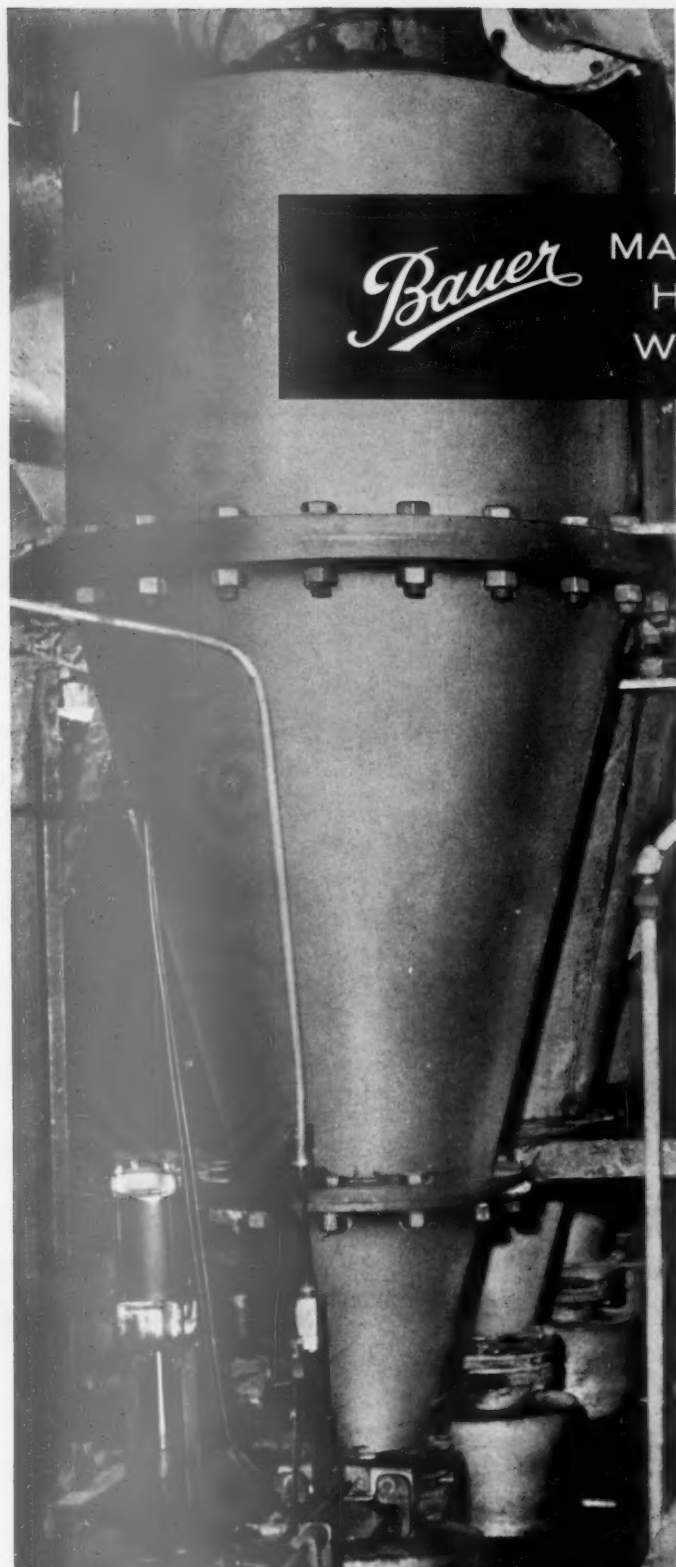


MONSANTO DEVELOPER IN **PLASTICS**

- styrene copolymer—internally plasticized for greater processing efficiency.
- clear, glossy, non-yellowing coating—stays white during processing and after long storage periods
- grease-resistant; resistant to cold or hot boiling water
- products won't stick, even at high dispensing machine temperatures
- odorless and tasteless—no "paper odor" even after contact with hot water; no "paper taste" imparted to contents

For samples and complete product and regulation data on Lytron 6, write to Monsanto Chemical Company, Plastics Division, Room 731, Springfield 2, Massachusetts.

MACHINE DESIGN COURTESY JOHN WALDRON CORP.



Bauer

MAGNA* CLEANERS
HELP INCREASE
WIRE LIFE **60%**

Wire life of only 4½ to 5 days was an expensive problem at a large southern kraft board mill.

To correct this situation, two things were done. First, the board machine was equipped with a Flo-Vac to reduce drag on the wire. However, sand, pipe scale, inorganic grit and other abrasive material in the pulp continued to shorten wire life drastically.

Next, eleven Bauer Magna Cleaners were installed. Nine of these 46" diameter units, which stand eleven feet high, clean stock for the base sheet. Two deliver to the secondary headbox. As soon as the cleaners were installed wire life jumped to 7½ to 8 days—an increase of 60%! Mill personnel estimate this represents a saving of 18 wires a year on one machine, or approximately \$63,000, not including labor costs or down time!

These efficient, low pressure cleaners handle a large volume . . . they could help save money in your mill, too. Ask for details.

*

Magna is Latin for big. Nearly 46,000 GPM . . . that's the total capacity of eleven Bauer Magna Cleaners in the installation described above.

THE BAUER BROS. CO., Springfield, Ohio



A "Special Detergent" for continuous washing of pickup felts

IGEPAL® CO-630

is economical, easy to apply...lengthens felt life

Because of its truly nonionic nature, Igepal CO-630 does not form insoluble precipitates with calcium and magnesium, as does soap, or anionic based detergents. This nonionic detergent is compatible with alkaline salts, acids and commonly used solvents, but contains no harmful alkalis to weaken felt.

Paper machine wet-end felts can be washed with Igepal CO-630 solutions in the usual felt conditioning units, either continuously or intermittently while running; there is a minimum of foaming action. Igepal improves drainage, is positively non-shrinking. Complete technical information supplied on request. Simply write—

From Research to Reality

GENERAL DYESTUFF COMPANY • ANTARA CHEMICALS

SALES DIVISIONS OF GENERAL ANILINE & FILM CORPORATION

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SALES OFFICES: New York • Providence • Philadelphia • Charlotte • Chattanooga • Chicago
Portland, Ore. • San Francisco • Los Angeles. IN CANADA: Chemical Developments of Canada, Ltd., Montreal

Igepal CO-630, manufactured by General Aniline & Film Corp., is sold outside the United States and Canada under the tradename Antarox CO-630 by distributors all over the world.

Reliance Super 'T' V*S Drives



Both of these control units are rated at 50 horsepower! Actually, the new, small Super 'T' V*S cabinet packs more punch!

LIKE the Reliance Super 'T' Drive Motor, new V*S power units utilize Class B insulation, permitting a more compact unit. 100% overloads of one minute duration are accomplished without failure! Advanced design of ventilation keeps control and power units cooler . . . another reason why smaller size is possible. And service life is substantially extended.

Matched system design of drive motor,

power unit and controls produces a highly efficient, integrated drive—to give you a wide range of stepless, variable operating speeds from a-c. circuits.

Super 'T' V*S Drives are available for immediate delivery. Check your Reliance salesman for delivery schedules on the full line, 1—350 hp., Bulletin Number D-2506, has been prepared to give you complete information. Write for it.

D-1641

Product of the combined
resources of
Reliance Electric and
Engineering Company and its
Master and Reeves Divisions

**RELIANCE ELECTRIC AND
ENGINEERING CO.**

DEPT. 189A, CLEVELAND 17, OHIO
Canadian Division: Toronto, Ontario
Sales Offices and Distributors in Principal Cities

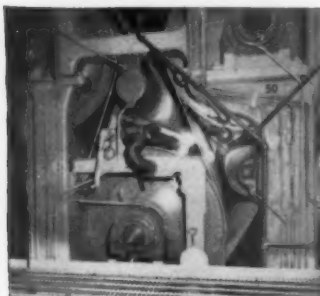


Duty Master A-c. Motors, Master Gearmotors, Reeves Drives, V*S Drives, Super 'T' D-c. Motors, Generators, Controls and Engineered Drive Systems.

**union
camp** No. 7
MACHINE
Savannah, Georgia



Note extensive window area in this Ross Totally Enclosed Hood



Ross Dryjector which delivers the air at the center of the sheet and directs it outward to the edge.

Highlight of Union Bag-Camp's "C Program" is the high speed No. 7 paper machine. For this up-to-the-minute, versatile machine, J. O. Ross provided the complete air system including the totally enclosed paper machine hood, the bottom felt dryer, two roof heating and ventilating units, two wet end exhaust units, two Ross Dryjectors, the calender cooling unit and the pneumatic trim conveyor.

Today, modern paper machines call for Ross Engineered Air Systems.



J.O. ROSS ENGINEERING

A Division of Midland-Ross Corporation/730 Third Ave., New York 17, New York
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**Market pulp
is our business**

...and it can pay you to do business



with Buckeye

Brief facts about Buckeye

- Modern kraft mill at Foley, Florida, with two production units
- 800,000-acre tree farm for assured future pulpwood supply
- Double-screening for cleaner krafts
- Eight-stage bleaching for higher brightness plus strength
- Constant sampling at 27 control points
- Doubled kraft capacity since 1955
- Advanced pulp research program
- Forty years' experience as pulp supplier to paper industry

Let us tell you more

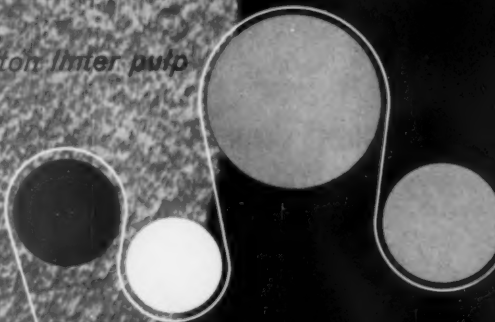
Now, more than ever, Buckeye is the prime source for bleached kraft. For brochure describing Buckeye pulps for the paper industry, write

BUCKEYE CELLULOSE CORPORATION
Memphis, Tenn. • Foley, Florida

Buckeye Kraft

Also cotton linter pulp

Chemically modified cotton linter pulp

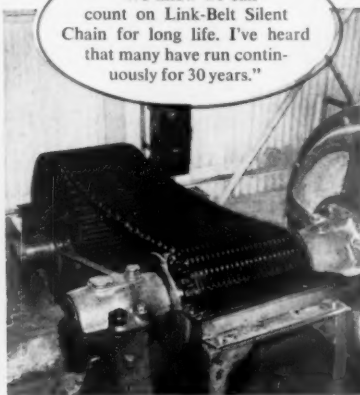




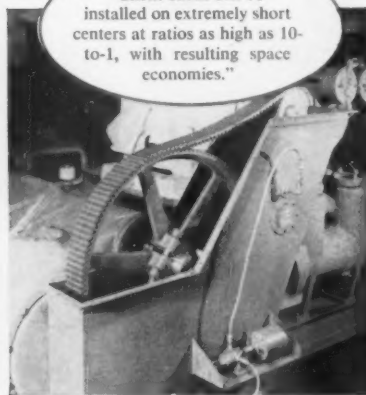
**"Join me on a plant tour... see why
we're modernizing
our drives with
Link-Belt Silent Chain"**



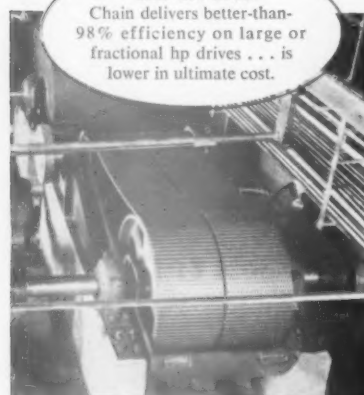
"When it comes to speed, we find Link-Belt Silent Chain is tops. It often operates at rates over 4000 fpm."



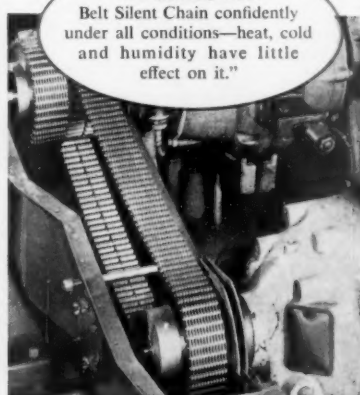
"We know we can count on Link-Belt Silent Chain for long life. I've heard that many have run continuously for 30 years."



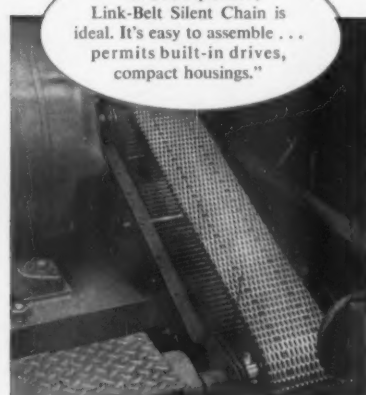
"Silent chain can be installed on extremely short centers at ratios as high as 10-to-1, with resulting space economies."



"Link-Belt Silent Chain delivers better-than-98% efficiency on large or fractional hp drives... is lower in ultimate cost."



"We can use Link-Belt Silent Chain confidently under all conditions—heat, cold and humidity have little effect on it."



"In close quarters, Link-Belt Silent Chain is ideal. It's easy to assemble... permits built-in drives, compact housings."



SILVERSTREAK SILENT CHAIN DRIVES

FULL DETAILS on Link-Belt Silent Chain are offered in 88-page Book 2425. Get your copy from your Link-Belt office or authorized stock-carrying distributor. Look under CHAINS in the yellow pages of your phone book.

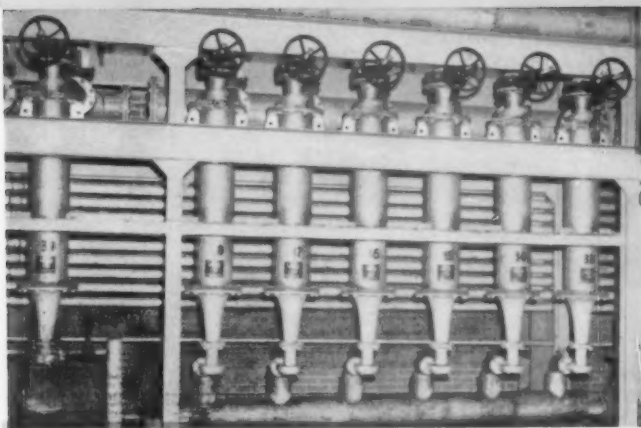
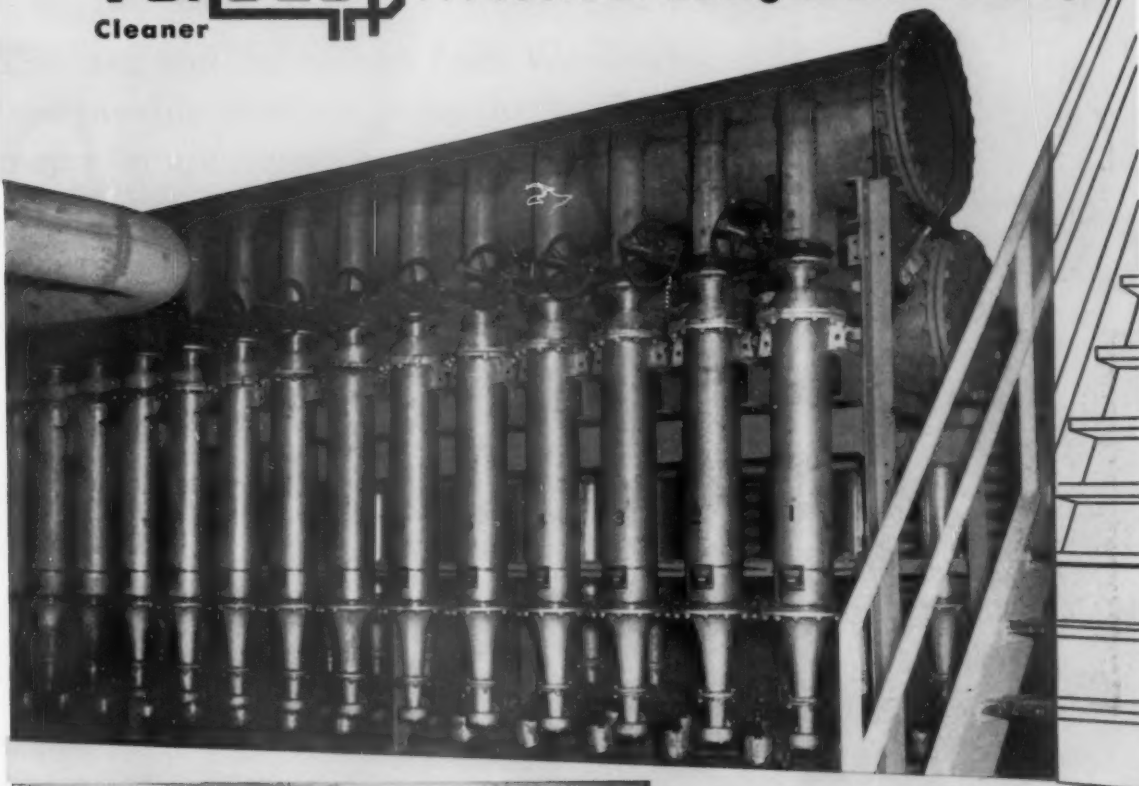


LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There are Link-Belt Plants, Warehouses, District Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World. ET 15,042

NICHOLS FREEMAN

VORJECT
Cleaner

... custom designed cleaning



For economical and efficient stock cleaning no unit equals the Vorject. Shown on this page are some of the thirty-nine Nichols Freeman 610 Vorjects in the stock cleaning system of a large southern kraft mill. Vorjects were chosen for a cleaner stock, with low fibre loss, no insuction of air and high shive removal efficiency.

Let us engineer a stock cleaning system for your mill.

NICHOLS

Representatives:

Harold E. Ingalls, N. Windham, Me.	A. H. Lundberg, Inc., Mercer Island, Wash.
Gulf States Specialty Co., Mobile, Ala.	L. Neil Brown, Chagrin Falls, Ohio
Douglas Robbins & Co., Lockport, Ill.	

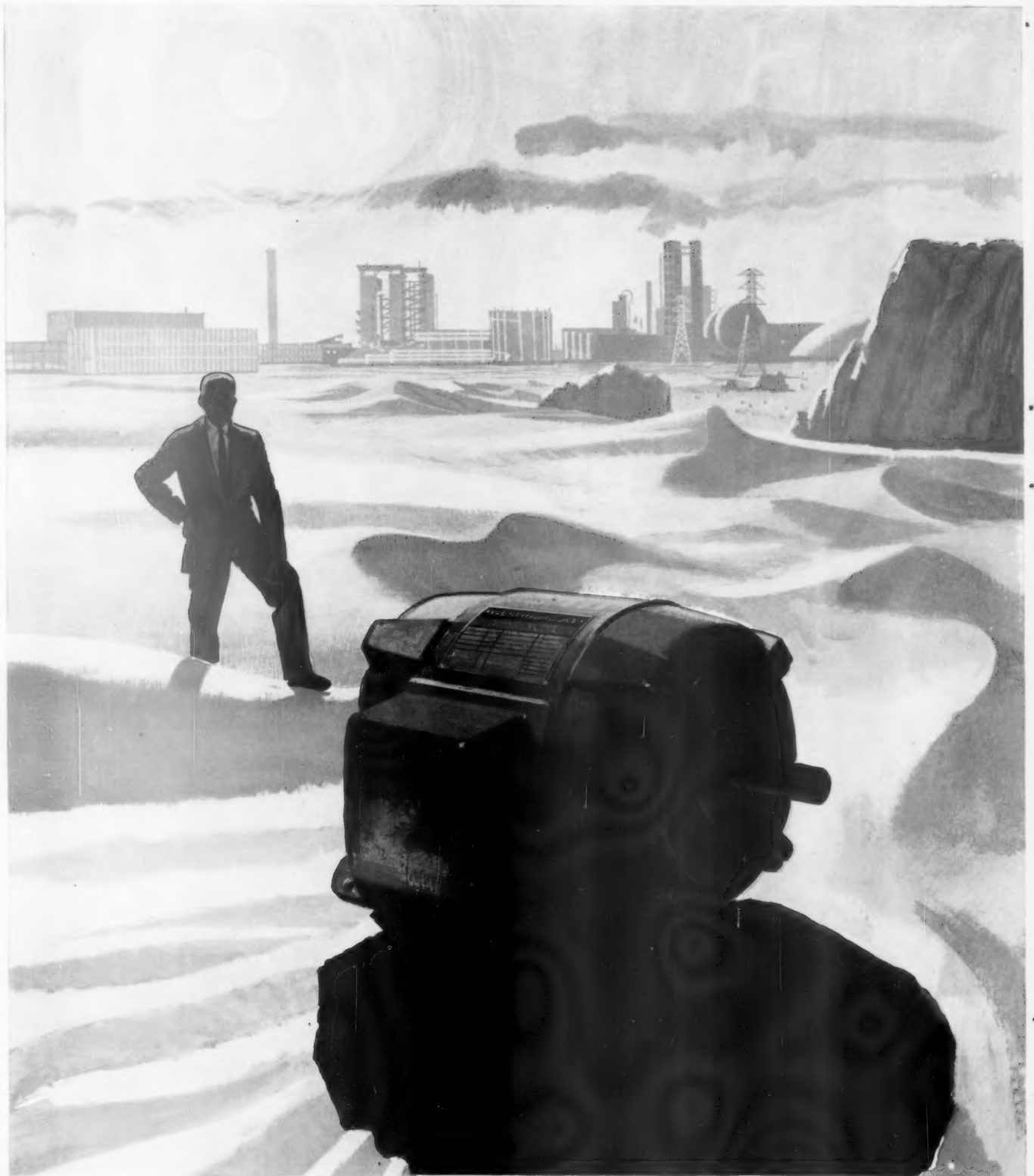
Nichols Engineering & Research Corp.

80 Pine St., New York 5, N. Y.

405 Montgomery St., San Francisco 4, Calif.

1477 Sherbrooke St. W., Montreal 25, Canada

NEW WESTINGHOUSE *Guardistor*



MOTORS LET YOU USE ALL THE HORSEPOWER YOU PAY FOR...SAFELY

The man and the motors from Westinghouse now provide absolute protection against motor failure caused by excessive heat . . .

Our Engineering Manager says:

"With the breakthrough development of the Westinghouse Positive Temperature Coefficient thermistors, for the first time we can provide inherent protection against motor failure caused by excessive heat. The solid-state thermistors buried in the windings instantly sense excessive heat from any cause and simultaneously warn of trouble or automatically take the motor off the line. Thus, motor protection is placed where only true motor protection can be . . . in the windings."

Our Marketing Manager says:

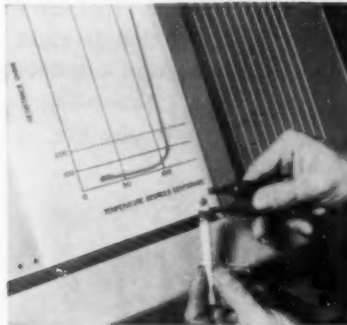
- "You can match the motor to the load . . . use all the motor you are paying for.
- Provides positive protection based on winding temperature . . . not load current and/or power supply fluctuations.
- Eliminates time and expense of changing winter-summer heaters. No nuisance tripping, it's fail-safe . . ."

Call your Mr. Westinghouse for the application of a Guardistor* motor to your drive requirements . . . write for *Questions and Answers About . . . Guardistor* (B-7876). Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. You can be sure . . . if it's Westinghouse.

*Trade-Mark
J-22160-R



Unlike remotely located sensing devices, PTC thermistors are buried in the windings of the Guardistor motor, instantly equating all temperature factors.



Ever alert PTC thermistors constantly totalize temperature, statically triggering an action *only* if critical temperature is reached.

MOTOR & GEARING DEPARTMENT

Westinghouse





STRONG as steel pipe



...at one-eighth the weight!



Circumferential Tensile Strength ... 80,000 psi



BONDSTRAND®

*the revolutionary fiber glass
reinforced epoxy pipe
for corrosive service*

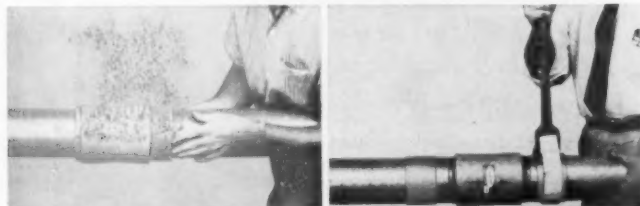


114

Here's a pipe that holds up indefinitely under the corrosive action of many salt, acid and alkaline solutions ... that can't contaminate or flavor the piped material ... that is rigid enough to resist sag, cold flow or deformation — flexible enough to follow normal ditch contours ... that remains smooth and unclogged throughout its entire service life ... that won't leak, even near its burst pressure.



Easy to install, with choice of locking wedge or threaded fittings.



Simple instructions with each shipment insure a perfect joint on the first try.



Dept. FG • 4809 Firestone Boulevard • South Gate, California

921 Pitner Ave.
Evanston, Ill.

360 Carnegie Ave. 2404 Dennis St.
Kenilworth, N.J. Jacksonville, Fla.

6530 Supply Row
Houston, Tex.

111 Colgate
Buffalo, N.Y.

IN THE PAPER INDUSTRY...

The resistance of BONDSTRAND pipe to chemical solutions and wet environments make it well suited to pulp and paper operations, including the transportation of pulp, stock, water, wastes and dyes. Tests are recommended for liquor applications.

**How much a year
can the
Foxboro Stock Blending System
save your company . . .**

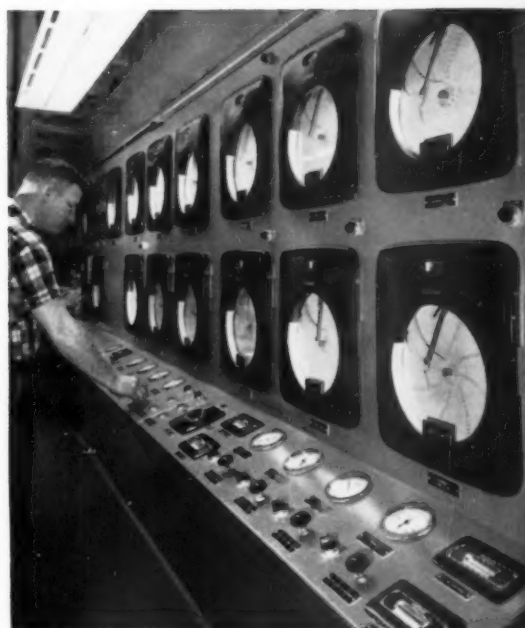
by increasing percentage
of first quality paper?.....\$_____

by reducing
overall waste?.....\$_____

by eliminating
batch beaters?.....\$_____

by reducing down
time between runs?.....\$_____

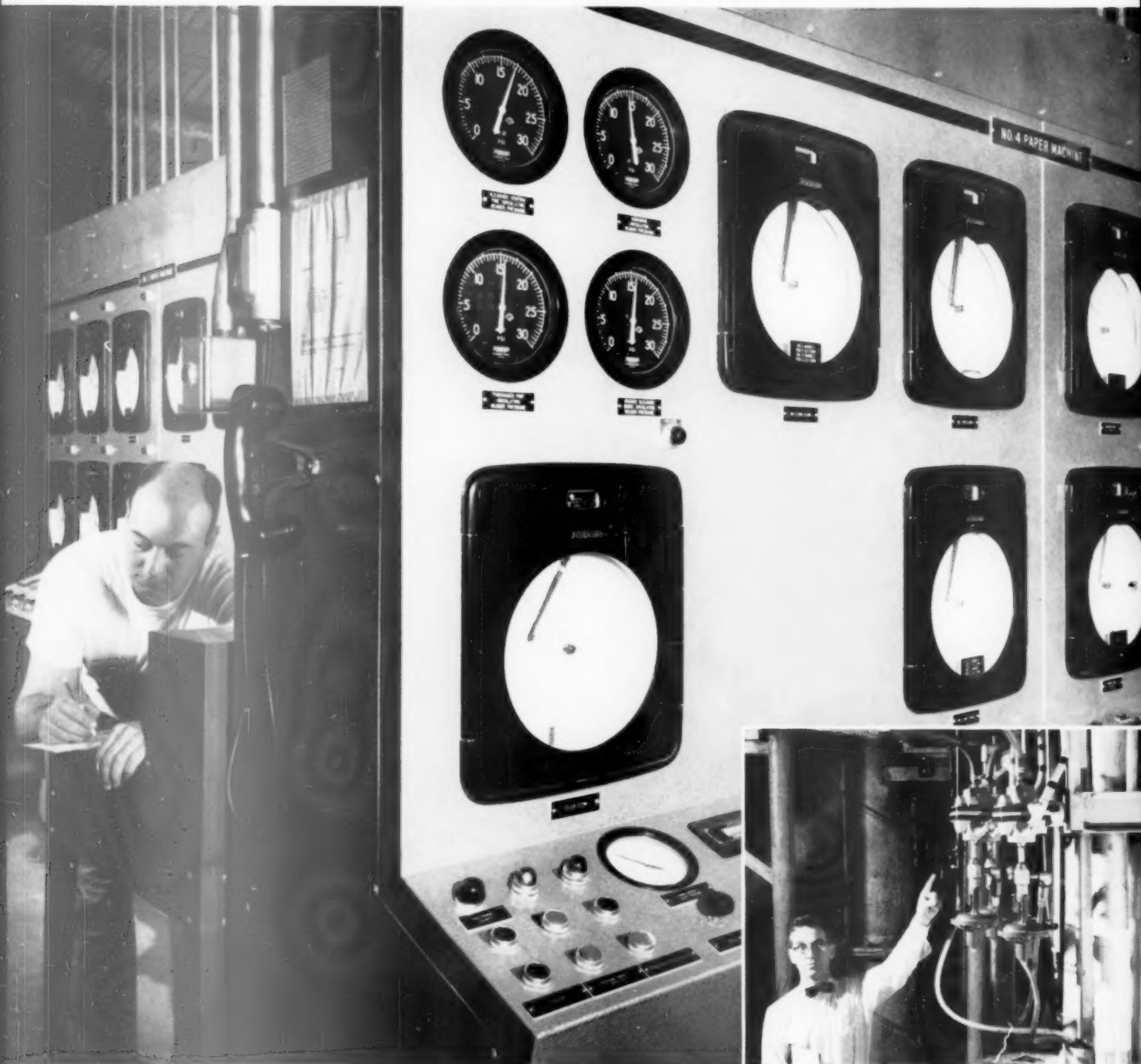
by increasing
total production?.....\$_____



**to help you answer this question
take a quick look at the experience
of one great papermaker . . .**

S.D. WARREN COMPANY
Warren's CENTRAL MILL
 STANDARD
Printing Paper Manufacturers

at S. D. Warren Company's **Foxboro Stock increase**



All four paper machines at Central Mill are equipped with Foxboro Stock Blending Systems. Control panels for Machines 3 and 4 are shown above. Machine superintendents report that because the Foxboro systems require less down time between runs, over-all production has been increased. Engineers and contractors for this program were Sumner Sollitt Company, Chicago.

Foxboro Magnetic Meters, $\frac{1}{10}$ in., $\frac{3}{16}$ in., and $\frac{1}{2}$ in. diameter, control dye flows to mixing hoppers above each paper machine. Quick-disconnect hose permits using same meters to serve several dye distribution headers. Dye proportions are set at control panel.

Central Mill

Blending Systems cut waste, production of first quality paper

**batch beaters eliminated . . . stock, dyes,
additives blended continuously, automatically**

More first quality paper . . . batch beaters completely eliminated . . . waste slashed. These are just a few of the cost reductions Foxboro Stock Blending Systems have produced at S. D. Warren's Central Mill, Muskegon, Michigan.

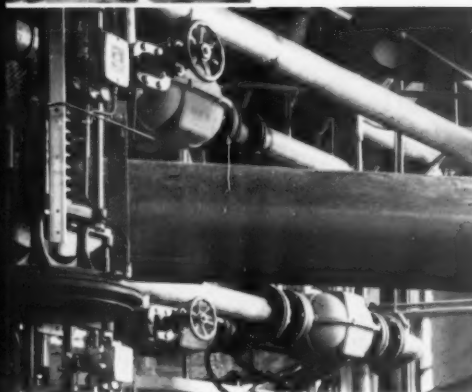
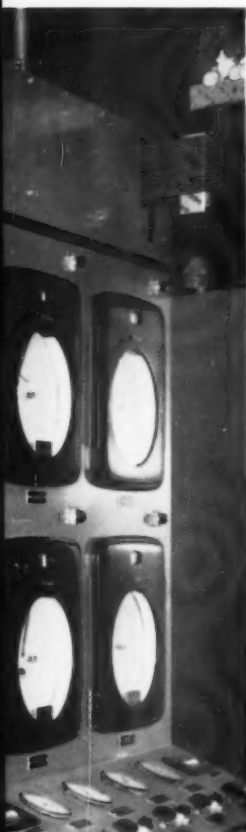
The unique Foxboro systems handle the whole job of stock proportioning. Machine tender sets desired stock, dye, and additive proportions on control panel for his machine — then walks away. Foxboro does the rest — blends pine, hardwood, broke, and purchased pulp; adds dyes and additives in proportions desired. System even adjusts for changes in machine demand while holding all proportions exactly constant. And it's all done continuously — automatically.

Foxboro Stock Blending Systems were installed on all four of Central Mill's Paper Machines as a major step in their continuing modernization program. Installation was handled by Foxboro during normal down-time periods so no production time would be lost.

Everyone at Central Mill — from top management down — is extremely enthusiastic about the performance of these Foxboro systems. You'll be enthusiastic, too, when you discover how quickly they'll pay for themselves in your mill — through better quality paper — through increased production. Ask your Foxboro Field Engineer for full details. The Foxboro Company, 999 Neponset Avenue, Foxboro, Massachusetts.

FOXBORO

REG. U. S. PAT. OFF.

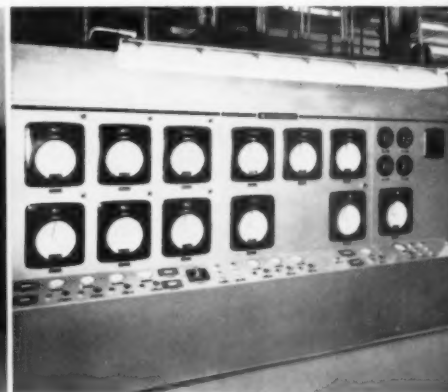


Foxboro Magnetic Meters, 3 and 4 in. diameter, control flow of stocks to blending chests — completely eliminate the need for batch beaters. Magnetic Flow Meters have no flow restriction of any type — cannot foul or plug up. Measurement is linear — accuracy guaranteed within $\pm 1\%$.



Foxboro d/p Cell* pressure transmitters are mounted right in the side of main feed-stock headers at the S D. Warren Mill. Precise operation of this entire blending system is assured by the accuracy and reliability of these sensitive pressure transmitters.

*Reg. U.S. Pat. Off.



Foxboro instrument panel for #2 Machine gives operator complete control of the blending operation. On it are mounted flow-proportioning controllers for four stocks as well as for dyes and additives. Also, the percentage setting dials which proportion each stream to total system flow.

Other Foxboro Systems that can help you improve production in the 60's...



Foxboro Digester Control. Uniform pulp, cook after cook — is what you get with Foxboro Automatic Digester Control.

To start a cook, operator simply turns a single knob — and Foxboro takes over. Results: perfectly controlled digester circulation with virtually no liquor pull-over; uniform permanganate; practically no rejects. All automatic — from fill to blow — all resulting in high yield and excellent uniformity.

Foxboro Caliper Profiler. Put in a sample strip, push a button, and in a matter of minutes the Foxboro Caliper Profiler gives you a continuous chart record of sheet thickness — all the way across the sheet.

No time-consuming spot checks with hand micrometers — no awkward, cumbersome testing machines. The Foxboro Profiler shows you exactly where caliper is off — offers a new high in quality control.

Foxboro Sheet Moisture Control. Direct measurement of sheet moisture at the reel . . . fast, precise control of steam to the dryers . . . moisture control of any weight stock: tissue, pulp, kraft, newsprint, board or specialties. You get all this and more when you install the Foxboro Sheet Moisture Control System.

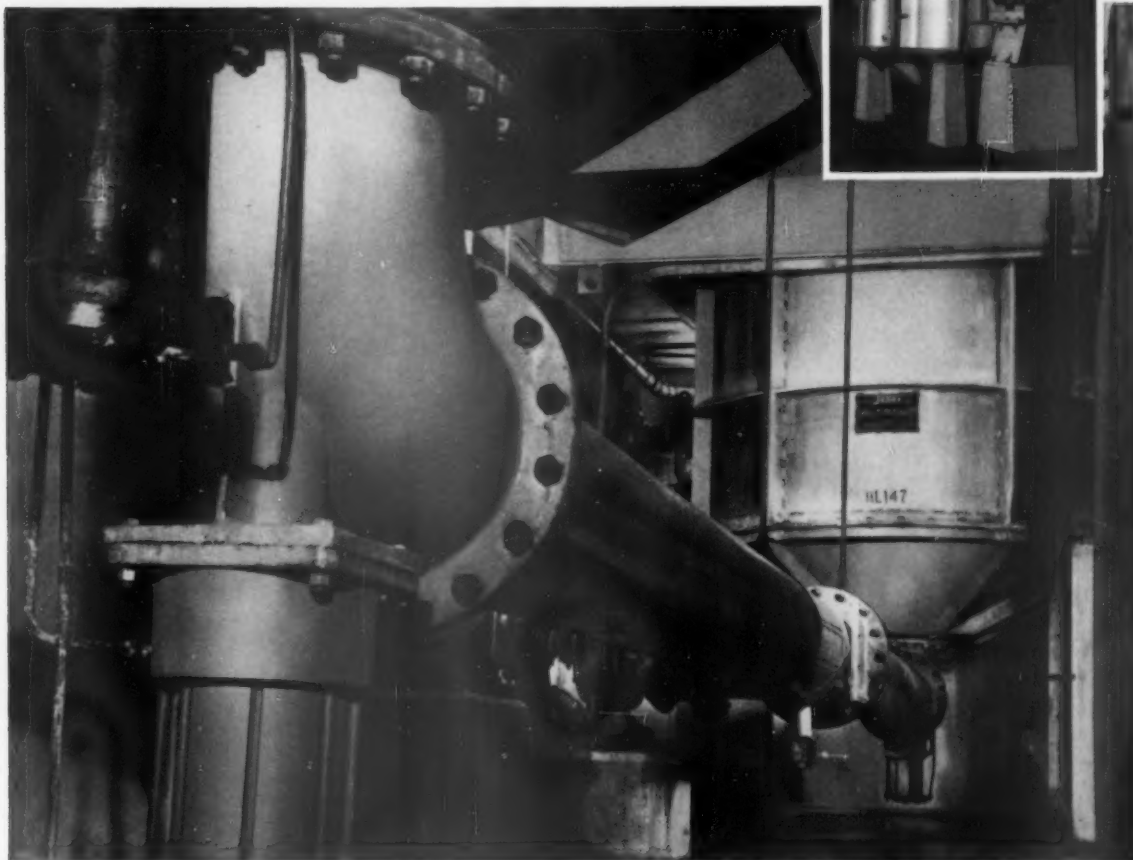
An invaluable aid to improved quality paper; to elimination of costly rejects; to shipping at precisely the moisture content specified.



This advertisement is printed on Warren's Lusto 100#, manufactured at their Central Mill, Muskegon, Michigan

FOXBORO
REG. U.S. PAT. OFF.

**Jones Hi-Lo Pulper at Hurlbut Paper gives
TOP PERFORMANCE
ON TOUGH WET STRENGTH**



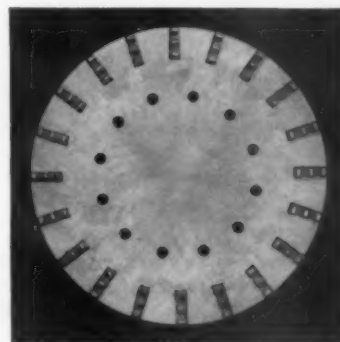
Hi-Lo installation at Hurlbut Paper Co., South Lee, Mass.

Defibers completely with minimum power

At Hurlbut, as in dozens of other mills across the country, the two-rotor Jones Hi-Lo Pulper has proven its ability to provide fast, progressive disintegration at low H.P. days per ton. It is especially effective on wet strength and other hard-to-defiber materials.

The Lo-Speed rotor breaks up the broke or bales economically and circulates the stock across the tank where repeated impacts by the Hi-Speed rotor complete defiberization. Blade construction prevents fiber cutting and freeness drop is eliminated.

For maximum performance with minimum power and maintenance, get full information on the Jones Hi-Lo Pulper. Write for bulletin EDJ-1063B.



Notched blades of Hi-Speed rotor project only $\frac{1}{4}$ ", use power most efficiently for defibering. Held securely by Duroid wedges, they can be replaced easily and inexpensively.



Canadian Associates:
The Alexander Fleck Ltd.
75 Spencer Street, Ottawa

Jones

PULP MILL EQUIPMENT AND
STOCK PREPARATION MACHINERY

Why have so many installations of chemical recovery units (in the past five years) been equipped with Bailey instruments and controls?

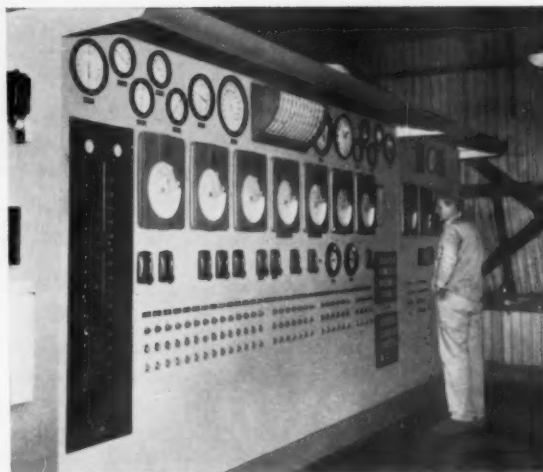
Bailey assures reliable and continuous operation with a control system engineered specifically for the chemical recovery process.

Every Bailey installation gives top performance. It's the reason for Bailey's long and prominent association with chemical recovery . . . and it's why you'll find Bailey instruments controlling virtually every process within many pulp and paper mills.

Bailey starts with sound engineering and economic evaluation of your needs . . . an evaluation based on more than 40 years' experience, kept fresh by a national network of engineers in constant contact with your industry.

Then the selection of the *right* system . . . selection made simple by a complete line of equipment . . . from conventional instruments through sophisticated data processing systems.

That's the Bailey way. Put this logic, capability and performance to work on any process control problem you have. Call on the Bailey District Office or your nearby Resident Engineer. Or, write direct.



In Oregon—maximum economy, minimum maintenance since 1958; Bailey control center for chemical recovery unit at Georgia-Pacific Paper Co., Toledo, Oregon. Evaporator system (right) is also operated from this Bailey center.

P152-1

PULP AND PAPER DIVISION
BAILEY METER COMPANY
1037 IVANHOE ROAD • CLEVELAND 10, OHIO
In Canada—Bailey Meter Company Limited, Montreal



**PUGET
PULP**

when it must be **STRONG**

Puget Pulp's Bellingham Barker



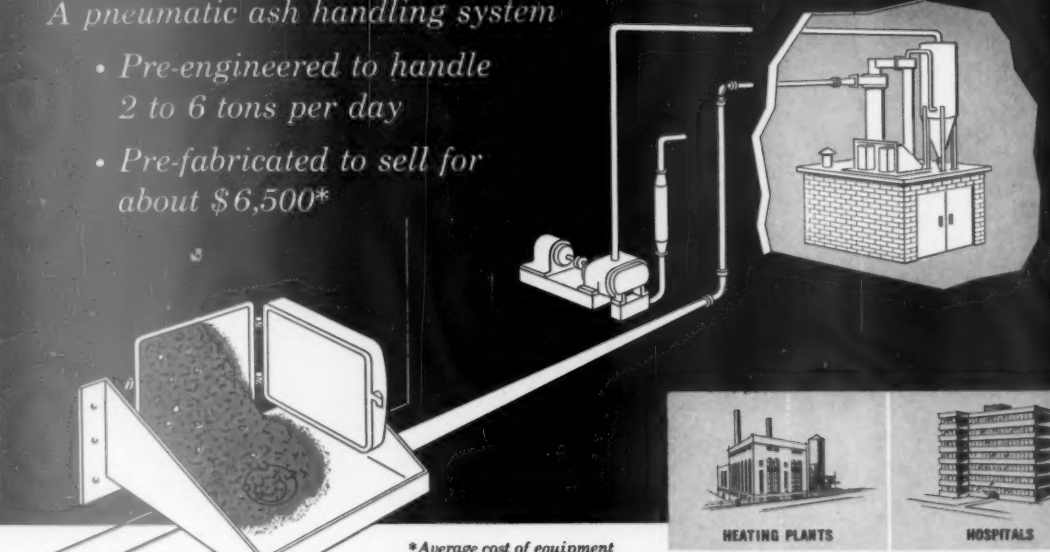
start with PUGET PULP...
...the uniformly strong, clean, white
chlorine dioxide bleached
softwood sulphite

PUGET SOUND PULP & TIMBER CO.
BELLINGHAM • WASHINGTON

THE FIRST BIG BREAK IN ASH HANDLING COSTS FOR THE SMALL COAL BURNING PLANT

A pneumatic ash handling system

- Pre-engineered to handle 2 to 6 tons per day
- Pre-fabricated to sell for about \$6,500*



*Average cost of equipment for a 2-boiler installation

Engineers of small coal burning plants—Heating Plants, Hospitals, Hotels, Institutional Buildings, Military Installations, Municipal Power Plants, Office Buildings, Schools, Colleges, Small Industrial Plants—have long wished for a small, practical ash handling system that would eliminate much of the inconvenience, dust and constantly increasing labor costs of manual ash removal. Available ash removal systems could not be economically justified where less than 10 tons of ash per day was produced.

Aware of this need, The Allen-Sherman-Hoff Company assigned its best engineering talent to untangle the problem. The result: the new A-S-H Econo-Ash System.

A major step in solving this problem was pre-engineering. Use-proved designs of major components were re-engineered to handle smaller quantities; new equipment was designed and tested. One requirement was basic: cost reduction without loss of efficiency. Installation, for example, was made so simple that it can be made with local labor.

We've prepared a 4-page brochure to explain the new Econo-Ash System—how it operates, its variations and its advantages. We'll send it to you immediately upon request. It also lists the A-S-H Sales Engineers—one is near you—who will be glad to show you how, in most installations, the Econo-Ash will pay for itself in two years or less.

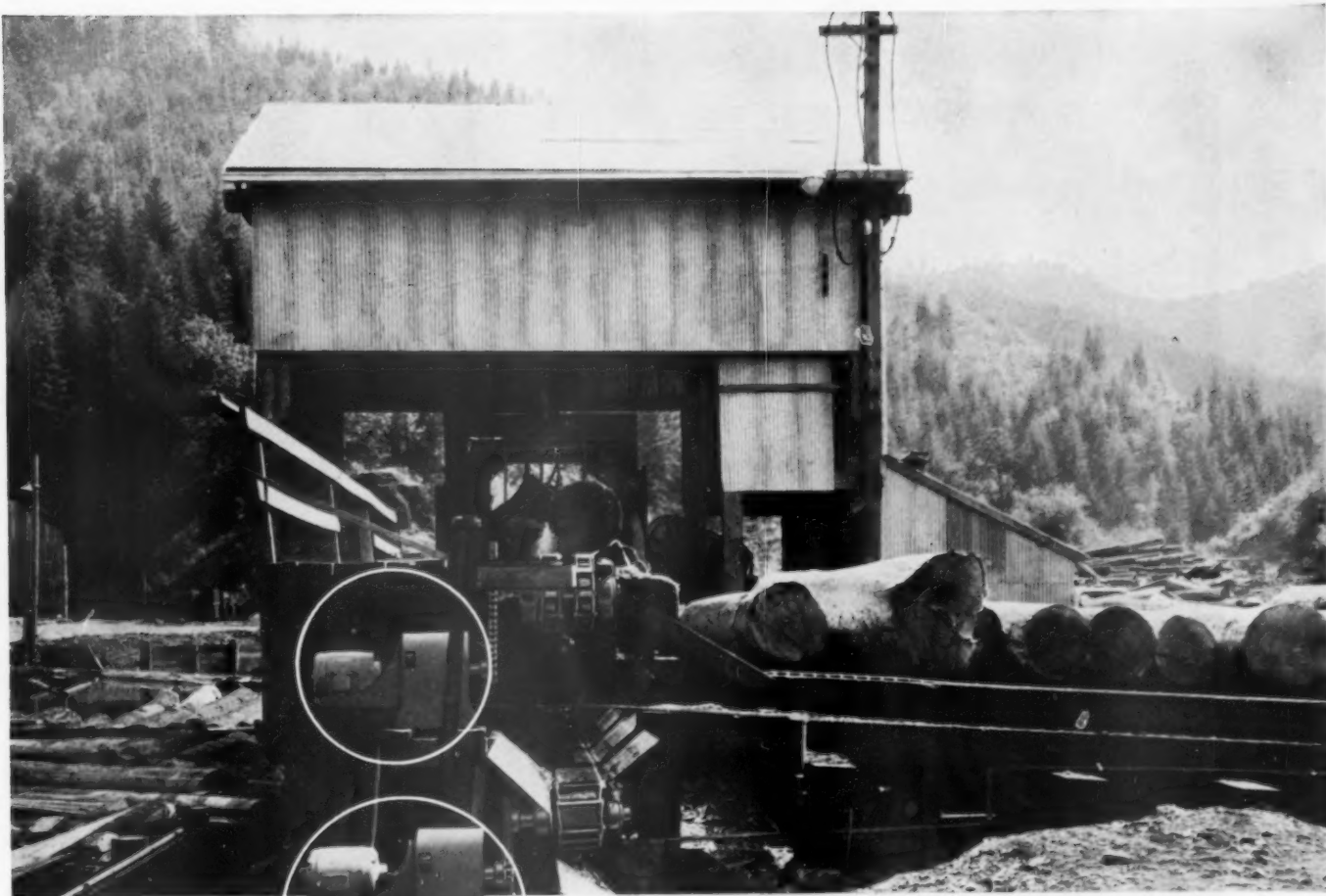


**MATERIALS
HANDLING
SYSTEMS**



the **Allen-Sherman-Hoff** company

247 E. Lancaster Ave., Wynnewood, Pa.
Offices and representatives in principal cities



FALK Motoreducers driving log conveyor and refuse conveyor at the modern mill of The Bohemia Lumber Company, Culp Creek, Oregon.

FALK all-steel Motoreducers give you longer service life

Whether your load conditions are normal or heavy, the extra rigidity of all-steel construction (more than twice that of cast iron) maintains better alignment of revolving elements under load...a vital factor in prolonging the service life of gears and bearings.

And if your installations are subject to shock loads, or accidental external impacts, you're way ahead when you install Falk All-Steel Motoreducers. These rugged units do not destroy themselves by tearing off their feet under jamming overloads, nor are their housings subject to cracks which both dissipate the vital lubricant supply and allow revolving elements to get out of alignment.

All-steel construction is one of the built-in extras that you get in Falk Motoreducers. Others include: (1) inherently stronger gear teeth (by AGMA standards), thanks to exclusive Falk extra-depth, high pressure angle helical gears; (2) maximum mechanical efficiency (98½% per gear mesh, under full load); (3) your choice of standard units (horizontal, vertical or right angle) to fit your precise requirements.

HORSEPOWER RANGE: to 75 hp . . . **STANDARD OUTPUT SPEEDS:** 780 rpm (high) to 1.2 rpm (low).

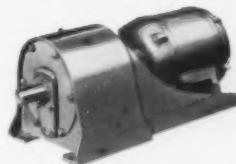
Prompt delivery from distributor stocks, or from warehouse or factory. Ask your Falk Representative or Authorized Falk Distributor for **Bulletin 3100**.

THE FALK CORPORATION, MILWAUKEE 1, WIS.
MANUFACTURERS OF QUALITY GEAR DRIVES AND FLEXIBLE SHAFT COUPLINGS
Representatives and Distributors in most principal cities

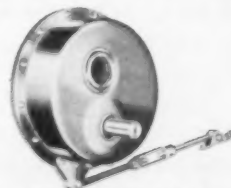
FALK

... a good name
in industry

Take your choice of all-steel drives when you specify Falk



THE FALK ALL-MOTOR MOTOREDUCER
...the original All-Motor unit



THE ALL-STEEL FALK SHAFT MOUNTED DRIVE

Torque ratings to 44,000 lb-in at low speed shaft. Also available in flange-mount design.

FALK and ALL-MOTOR are Registered Trademarks.



CALL HOOKER **FOR TECHNICAL HELP ON ClO_2**

Maybe it's time for a seminar with your operating and technical people on any and all phases of chlorine dioxide generation and bleaching . . . with emphasis placed wherever you wish. There's much we can tell you about the handling, storage, and use of sodium chlorate, too. Just give us a call

or write us a letter and we'll gladly place our technical service group at your disposal.

HOOKER CHEMICAL CORPORATION
1909 Forty-seventh Street, Niagara Falls, New York

Sales offices: Buffalo Chicago Detroit
Los Angeles New York Niagara Falls
Philadelphia Tacoma Worcester, Mass.

In Canada: Hooker Chemicals Limited, North Vancouver, B. C.





THE IMPCO S20-5 BARKER FOR HARDWOOD OR SOFTWOOD FROZEN OR CROOKED!

The S20-5 delivers a dependable high annual production rate of cleanly barked logs at very low maintenance and operating costs. This dependability, due to its extra-rugged design, is maintained with frozen crooked hardwood. Present installations average 250 cords/day with reported maintenance costs of 3 to 4 cents/cord, on logs in the 3" to 19" diameter range, down to 5' in length.



IMPROVED
MACHINERY INC.
NASHUA, NEW HAMPSHIRE

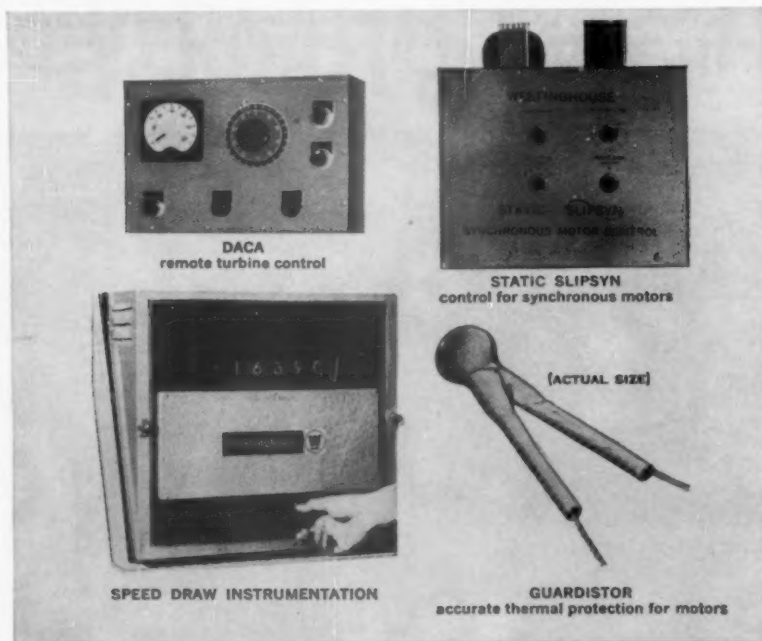
In Canada:
Sherbrooke Machineries Limited
Sherbrooke, Quebec



A PRACTICAL, STEP-BY-STEP PROGRAM TO RAISE PRODUCTIVITY, IMPROVE PRODUCT QUALITY

Westinghouse *Progressive Automation* is a step-by-step program to help you reach your goals as economically as possible . . . and is thoroughly practical because it is tailored to your mill. Through *Progressive Automation*, many mills have already increased output, reduced off-grade losses through better quality control.

Westinghouse is ready today to help you plan and execute your next step in automatic production. We are prepared to recommend, furnish, install and maintain all equipment to fulfill your plan. For the first time, you are offered one source for all controls, computer systems and all other basic electrical equipment for paper mills . . . transformers, switchgear, motors, gearing, drives. You can be sure . . . if it's Westinghouse.



DACA . . . ULTRA-PRECISION IN PROVIDING AND CONTROLLING POWER

Turbine-driven paper machines are now being controlled by the most precise equipment ever offered the industry—DACA* (Digital Analog Control Apparatus). Rapidly rising standards of paper quality require exact control of machine drives over a wide range of speeds. Here's how DACA meets this need. First, DACA holds line shaft drives to plus or minus 0.1% of preset speed through a 10-to-1 speed range. Second, a preset control gives automatic, precise speed selection throughout this speed range. DACA combines the best features of digital and analog techniques and uses static circuitry to provide high reliability . . . less down time.

SPEED-DRAW INSTRUMENTS . . . UP-GRADE EFFICIENCY, ACCURACY OF NEW OR EXISTING MACHINES The objective of this Westinghouse instrumentation—and to date the only practical equipment available—is more

precise production control and reduction of off-grade losses. With digital readout, operators know the speed of any machine section at any time. Digital circuitry eliminates drift and, therefore, error. Either speed or draw is read to within one foot per minute, or 0.1 fpm. Both readout and printout devices are available.


SLIPSYN CONTROL . . . THE FIRST AND ONLY STATIC DEVICE FOR ACCURATE CONTROL OF SYNCHRONOUS MOTORS New Westinghouse Static Slipsyn® Control precisely applies motor field excitation at proper speed and pole position up to and including 99% of synchronous speed. Transistorized networks throughout provide a new measure of reliability for automatic production. There are no moving parts to wear, corrode or fail. Existing control can be easily converted to static Slipsyn.

GUARDISTOR . . . STOPS MOTOR FAILURE CAUSED BY EXCESS HEAT The exclusive new Westinghouse Guardistor*

motor gives you direct, accurate thermal protection against motor burn-out. A PTC (positive thermal coefficient) thermistor, no larger than an aspirin, is embedded in motor windings, senses temperature rise instantly. At a predetermined critical temperature, thermistor has an approximate 100-to-1 change in resistance, activating the predetermined control function to stop failure.

For details on other Westinghouse apparatus for paper production, turn the page . . .

*Trade-Marks

Westinghouse 

ADDITIONAL WESTINGHOUSE PRODUCTS FOR THE PAPER INDUSTRY

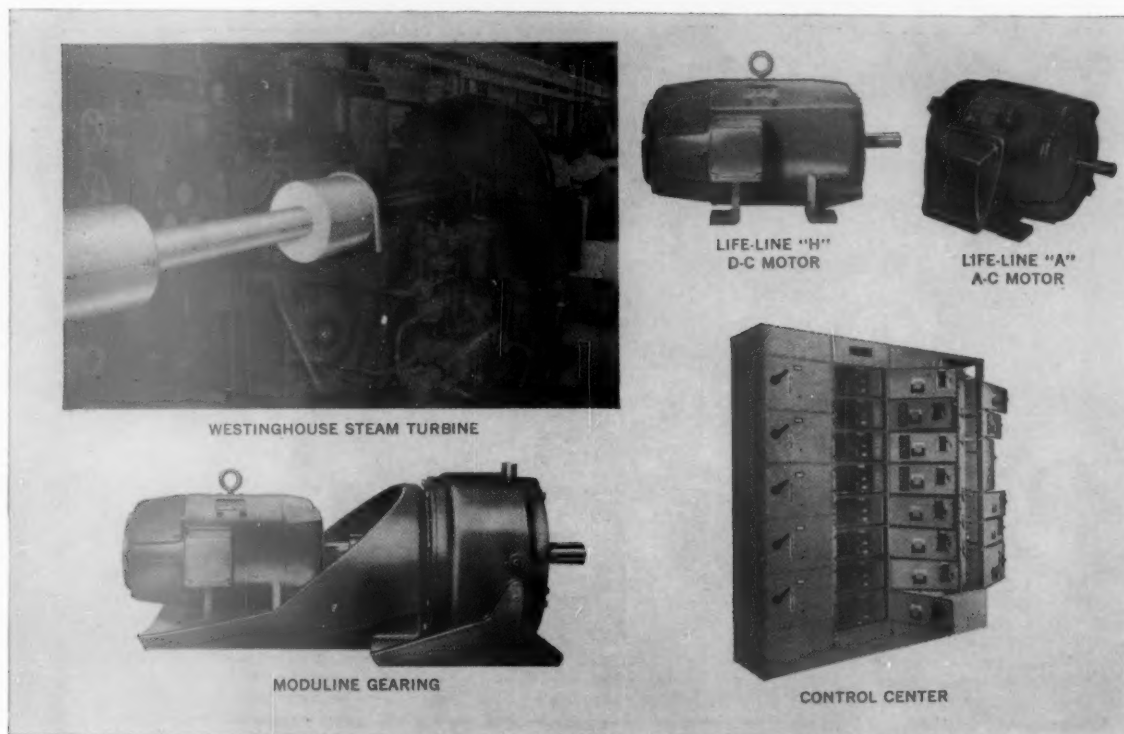
WESTINGHOUSE STEAM TURBINES . . . PRECISE SPEED REGULATION OVER A 10-TO-1 RANGE For mechanically driven paper machines, Westinghouse variable speed turbines have long proved to be the ideal power source. Extremely close speed regulation is the key to making high-quality paper . . . and this turbine provides it over a 10-to-1 and greater range. Same regulation advantages are inherent for driving multiple generator sets on sectional drive.

NEW D-C MOTOR . . . 35% INCREASE IN COMMUTATING ABILITY Newly designed, the Westinghouse totally enclosed Life-Line® "H" d-c motor now gives you even higher performance, as measured by a 35% increase in

commutating ability, and a new armature, cutting inertia 55%. The result is faster response, improved insulation and ventilation.

LIFE-GUARD . . . FROM INSIDE OUT, MAXIMUM PROTECTION AGAINST MOISTURE, CHEMICALS Life-Line "A" motors, the familiar work horses of industry, now have the super-protection of new Life-Guard* insulation on drip-proof motors. Consists of a completely new vacuum-impregnated epoxy encapsulation of all windings. Standard Life-Line "A" motors are protected by dependable Bondite-Mylar† insulation, giving you twice the life expectancy of conventional insulations.

†DuPont Registered Trade-Mark



MODULINE GEAR UNITS LET YOU CHANGE GEAR RATIOS RIGHT IN YOUR OWN MILL The modular design of Westinghouse Moduline* drives saves you time and money. Now you can change gears right in your own mill to take advantage of changing manufacturing techniques on improved processes. No more delays . . . Moduline never becomes obsolete, always permits rearranged configuration rather than expensive replacement. This is the newest member of the Westinghouse family of geared drives, reducers and gearmotors designed for the paper industry.

CONTROL CENTERS . . . FLEXIBILITY TO CREATE PRODUCTION LINES FOR TODAY AND THE FUTURE Motor controls, compactly grouped in structures such as this, free production areas, provide centralized control. In-

dividual control units may be added, removed or replaced quickly and easily. One location speeds maintenance and service. One-man supervision means coordinated motor operation, a basic requirement for automated lines.

Your nearby Westinghouse representative can help in putting *Progressive Automation* to work for you. Give him a call, or write Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pa. You can be sure . . . if it's Westinghouse.

*Trade-Marks
J-96152-3



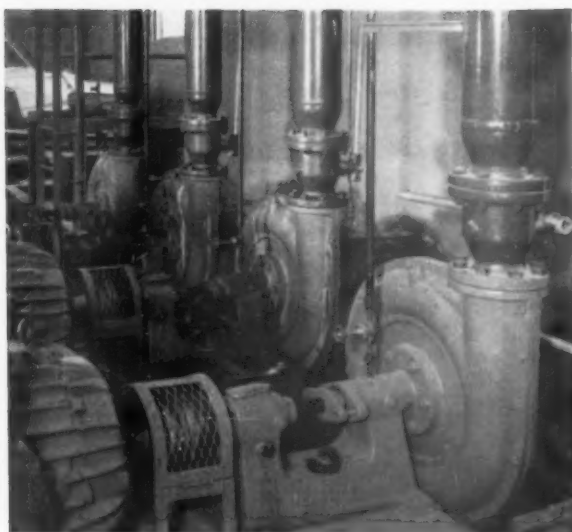
Westinghouse

Jamesbury

"Double-Seal"TM
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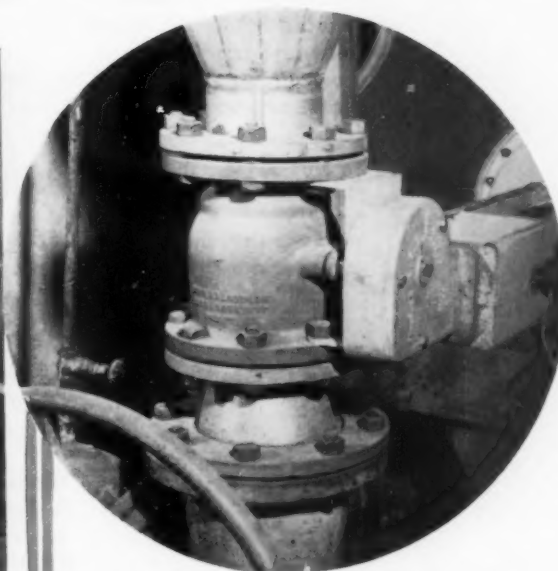
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PULP & PAPER — September 1960



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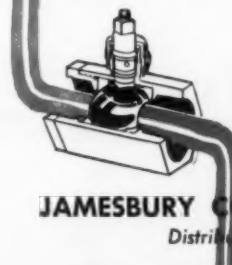
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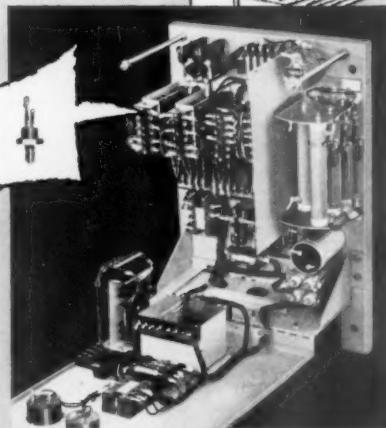
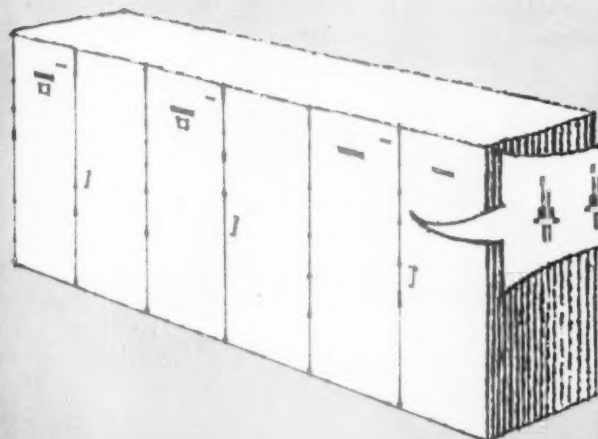
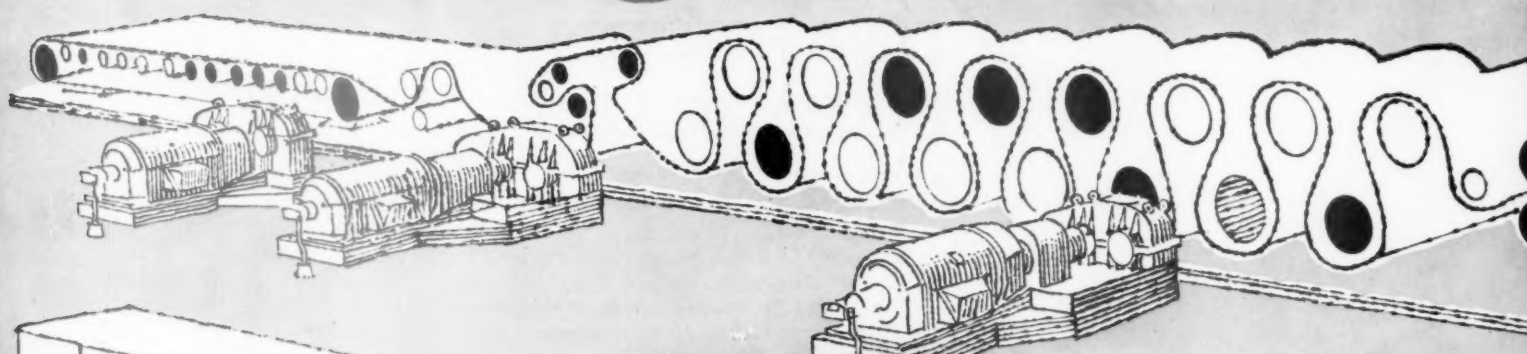
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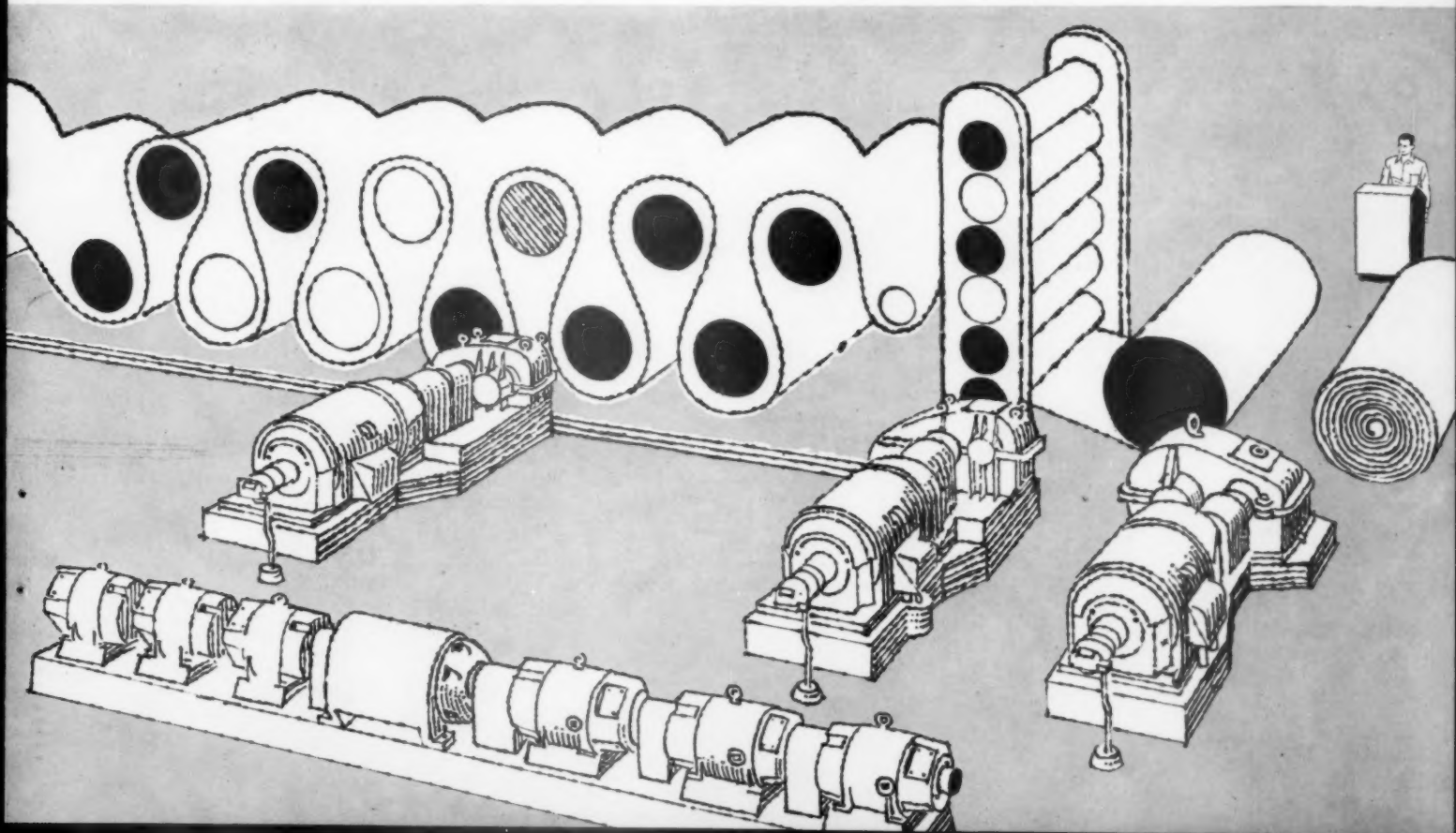
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Alarmed by its 1959 trade deficit of \$3.7 billion, the U. S. government has had meetings with some 40 exporting industries including pulp, paper and paperboard to help solve...

The Export Problem

● Briefly and simply, the position of the U.S.A. \$12 billion sales pulp, paper and paperboard industry is this: That the industry be accorded the same tariff treatment and other trading privileges as the pulp and paper industry in other countries. "We simply ask to compete without the burden of discrimination," says APPA's Executive Secretary Robert E. O'Connor.

There is an immediacy to the export problem because of pending GATT (General Agreement on Tariff and Trade) negotiations scheduled to begin this September in Geneva. There is general agreement by U.S. industry and government officials that previous GATT negotiations have brought little if any relief to U.S. exporters, while other countries have enjoyed concessions in U.S. tariffs.

It may well be, although exports do not comprise more than 3% of the industry's total output, that with the changing character of world trade no U.S. paper company can afford to be unconcerned. Actually, only about 10% of the industry is involved in exports. Says Mr. O'Connor, "The time has come when exports are no more than the logical extension of domestic trade. Let's face it. The world has shrunk. Doing business abroad is tantamount to interstate trade."

That exports should be the concern of every company in the industry is borne out by two recent examples. The industry operated at 92.5% capacity for paper and paperboard in 1959, produced some 34 million tons. It exported some 912,000 tons, about 3% of its production with a value of \$234.5 million. Without these exports, paper and paperboard mills would have operated at about 88% capacity. This would have left it with idle capacity of some 12%—and idle capacity costs money.

A second example: Market pulp

producers had overcapacity on their hands in 1959 and in the early part of 1960. Some said there would be overcapacity for 1960 and 1961. There was a sudden upturn in pulp exports, so much so that by mid-1960 the industry had increased its exports some 102%. Europe's imports alone of U.S. market pulp was up 134%. There is no overcapacity at present.

Three Stimulants

Interest in exports has been stimulated by three developments in the past few years. First, there is the growing determination of the undeveloped nations to throw off the shackles of illiteracy and to catch up and catch up fast with their neighbors. As they grow in the mores of civilization, they consume more paper in the form of newspapers, magazines and books. As modern marketing methods are adopted, more packages will be used.

The second development is the European Economic Community (commonly termed "European Common Market"). When it was established in 1958, some in their enthusiasm for its potentials foresaw an immediate golden age in Europe. Very definitely, PULP & PAPER has been told repeatedly by EEC members, the move to create a United States of Europe was inspired by the success of the original 13 colonies in America. But, as this publication has said before, a U.S.A. is not created overnight. Then too, there are different forces at work today in Europe, different from those which created the U.S.A.

But make no mistake about it. The potentials for a U.S. of Europe are

there. Europe needs more mass production. This it knows. It also needs mass distribution. This, it may not know. A surprising aspect of EEC is that the six country members do envision political unity and this is despite the historically strong nationalistic feelings of these nations. But paper company officials in EEC have told PULP & PAPER that their nations realize that they must unite to survive.

Triggered by the EEC and by the European Free Trade Assn. (EFTA), and a sudden awareness that EEC does and is working, Europe's economy is on the rise.

The third stimulant is the meeting in Rome last December sponsored by the Food and Agricultural Organization of United Nations. Here estimates were projected for pulp, paper and paperboard demand for 1965 and 1970. Encouraged by the success of this conference, a second has been scheduled for Tokyo in October to study how Asia's per capita paper consumption can be increased.

What Industry Is Doing

The American Paper & Pulp Association has sent representatives to a series of meetings in Washington called by the U.S. Senate to discuss how the export problem can be solved. More recently, the Writing Paper Assn., the Tissue Assn., the Kraft Paper Assn., and Printing Papers Assn. filed statements with the Committee on Reciprocity Information in Washington. An overall viewpoint, expressing many of the thoughts presented in this report, were made on behalf of the APPA.

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This special report on the U.S.A. export problem concerns every U.S. paper producer and its employees. Why exports have become the problem they are and how the problem may be solved are presented on the following pages. Special thanks are due to the American Paper & Pulp Assn. for their cooperation.  
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Why There Is An Export Problem

Current U.S. balance of payments suggests it is now time for U.S. Free World partners to offer concessions

By EUGENE COONEY
Manager, Import Committee of the
Paper Industry and Secretary,
Tariff Committee of APPA

● The export problem is three-pronged. First, as of July 1, 1960 the U.S. faces discriminatory action on the part of the EFTA which will put this industry at a competitive disadvantage. Second, longer term, the U.S. industry is subject to numerous discriminations which might be remedied at the forthcoming GATT negotiations. Third, the U.S. industry is placed at a competitive disadvantage because expenditure of American funds by national and international agencies to build up in other countries industries intended to produce for export, results in further competition with U.S. production in world trade.

The EFTA Situation

The United Kingdom is a major market for exports of paper and paperboard. In 1959, for instance, U.S. exported to the U.K. 187,000 tons of linerboard valued at \$24.1 million. Two of this industry's major competitors are Sweden and Norway, both members of the EFTA. Under the EFTA program, these two countries are granted a 20% tariff preference as of July 1, 1960 for their exports to the U.K.

Before July, the U.K. imposed duties of 14% or 15% ad valorem depending upon the weight of the board. These duties were assessed on the c.i.f. price plus an additional amount, called the commuted rate, of one half of 1%, representing costs incident to getting the goods through customs. This value is higher than usually quoted U.S. export value, which uses an f.o.b. port of exportation basis.

Before the July 1 deadline the U.S. and Swedish net prices plus duty of 47 lb. linerboard, for instance, was \$134.55 (U.S.) and \$135 (Swedish). On July 1, as a result of the 20% reduction in duty under the EFTA, the difference increased to \$5.27/ton. These are minimum differentials as they are based upon the assumption that c.i.f. prices will remain at the same level. Freight rates, however, are low, and it is expected they will rise shortly.

To be competitive, U.S. manufacturers will have to reduce their prices by about \$21/ton. This would produce so low a profit return at the mill as to make export sales unprofitable and will probably eliminate U.S. export trade in kraft linerboard to the United Kingdom.

We have asked the U.S. government for help to secure equal treatment with Sweden.

Long Term Discriminations

GATT negotiations have consistently worked that tariff concessions granted by the U.S. exceed that of concessions obtained. As recently as 1956, the dominant theme in tariff bargaining was aid in the development of the economies of other trading nations of the Free World.

Applications of this aid program adversely affected U.S. domestic pulp, paper and paperboard industry. For example, in the 1956 negotiations, concessions were granted by the U.S. on paper and paperboard imports totalling \$24 million in terms of 1954 imports, while other concessions obtained from other countries affected \$6.4 million of 1954 exports; a 3.75 ratio favoring paper and paperboard imports.

U.S. tariffs have been whittled away while other trading nations have escaped true reciprocity. Current U.S. balance of payments suggests it is now time for U.S. Free World partners to offer concessions.

Reaction at present appears to be most encouraging and the industry has substantial reassurance that in the forthcoming GATT bargaining sessions, U.S. government negotiators will be fully informed of the industry's problems and needs.

Reciprocity Long Overdue

If nothing else, this nation's current balance-of-payments problems has brought up short the magnanimity principle guiding our government's attitude in past tariff negotiations whereby our negotiators have not sought a full measure of reciprocity. That is not to say, however, that until recent years the following of such a principle was unwarranted. Indeed, in the overall spheres of international economics and politics this principle



MR. COONEY has studied the European Common Market since its beginning, sees it as a tremendous market for U.S. paper exports.

was meaningful to the strengthening of the Free World alliance.

Nevertheless the realities of balance of payments both as of today and the reasonable foreseeable future call for an altering of attitudes. In the national sphere, we recognize that a major factor in the forthcoming GATT negotiations will be the question of current U.S. balance of payments problems. We feel justified in asserting that true reciprocity is long overdue.

European Common Market

The European Common Market is one of the most fabulous developments in recent history. Even within the short span of two years, it has exceeded expectations of its planners and has grown and matured faster than many thought possible. Sooner or later the Common Market must have practical application to anyone who is thinking of exporting.

This industry's principal concern with EEC is its projected common external tariff. Although the Common Market does not include any principal world competitor in pulp, paper and paperboard, there exists the possibility of the eventual merger of the EEC with our Scandinavian competition.

EEC's projected common external tariff on primary paper and paperboard averages 18%, which is in contrast to our average of 8.3%. Every effort should be made to bring about a reduction of this common external tariff to a more equitable level.

Solving The Export Problem

Easing of restrictions of foreign trade barriers, credit insurance, increased foreign market reporting are some suggestions

By **ERIC G. LAGERLOEF**
Secretary, Export Committee of
American Paper & Pulp Assn.

• The Senate Committee on Interstate and Foreign Commerce held a special study on foreign trade in Washington for 10 days this year. Prime purpose of the meetings revolved around one fact: In 1959 the United States had incurred a trade deficit of \$3.7 billion. Purpose of the hearings was to determine and spell out the factors which have caused this trade deficit and to determine what remedial actions could be taken immediately and what could be done through legislation. The need for an international commercial policy was stressed particularly.

The problem is what can industry and government do both individually and collectively to increase exports?

What Can Government Do?

Of prime importance to U.S. exporters is the present government program of having foreign governments ease or remove restrictions against dollar-country imports through the medium of quotas (both quantity and set amount) and currency discriminations.

Of almost equal importance are the forthcoming GATT negotiations. It is the feeling of both the Department of Commerce and industry witnesses that previous GATT negotiations have brought little relief for U.S. exporters, while foreign countries have enjoyed sizable concessions from the United States. The feeling is that in view of these major past concessions and the serious U.S. trade imbalance, it is incumbent upon the foreign negotiating nations to change past policy and grant major concessions without seeking equal concessions from the United States.

Several witnesses stressed the importance of receiving major concessions from countries who are already our best customers to further consolidate or possibly expand our present strong position in those markets.

In view of the fact that many foreign governments have aided exporters for many years with credit insurance to stimulate exports, the recent action of the Export-Import Bank to

cover near-term political risks was favorably received by the business community, even though several witnesses believed that the guarantees should be longer than six months and should cover a larger field.

Several witnesses said both U.S. and international lending agencies should expand their lending programs, especially to underdeveloped countries to rapidly build up their economies so that they could more readily resist Communism and become markets for the world trading nations.

It was recommended by the Department of Commerce that the present economic reporting staff of the Department of State be expanded by 125 to 160 reporting officers, but that this new personnel be designated as commercial attaches, to be cleared by Commerce but as State Department staff. In conjunction with this increased commercial reporting the Department of Commerce is to expand its trade opportunities and trade listing reporting, as well as the frequency of the reports.

The Department of Commerce also has in mind to expand its trade fair program, expand the number of trade missions and to set up permanent world trade centers in key cities abroad. As to this new phase of trade promotions it is planned to set up centers in London and Bangkok for evaluation purposes.

What Can Industry Do?

Considerable concern was expressed by industry representatives at the 10 day meetings as posed by threats of lower wages abroad, rising produc-



MR. LAGERLOEF has long been APPA's expert on exports. He was recently commended by U.S. officials for his studies on markets abroad.

tivity and trade-bloc tariff barriers.

Industry witnesses recommended that industry should invest in plants abroad, or work out franchise or royalty arrangements with foreign concerns. Greater efficiency at home and new product developments would meet both the import threat and expand or create new markets overseas.

To answer critics of investment overseas that the U.S. was exporting jobs, several witnesses cited examples of where many domestic jobs were created through supplying components and materials for overseas plants of U.S. concerns. In addition, profits from overseas operations accrue to the benefit of the U.S. concern. The consensus of witnesses was that investment abroad would not increase unemployment at home, nor would imports from overseas U.S. operations be of major concern.

(Millions of dollars)

	Imports	Exports
Wood Pulp	\$314.7	\$94.8
Newsprint	665.7	16.3
Other Paper	27.0	75.7
Paperboard	7.1	63.4
Construction Paper and Board	11.7	6.0
Paper and Paperboard Products	31.9	73.1
	\$1,058.1	\$329.3

FEW COMMODITIES SURPASS imports of pulp, paper, paperboard and paper products. Industry does have a lesser but substantial volume of exports which are growing.

Companies Go International

This is one answer to exporting into trade blocs and pulp and paper firms are setting up plants, forming international partnerships

By ALBERT W. WILSON
Editor, PULP & PAPER

● Many pulp and paper companies have found it sound policy to enter into partnership with local companies of high standing in the countries where they are marketing. The experience of a local company in dealing with its own government agencies, and its development of markets and outlets for products over many years are probably two most valuable contributions to such partnerships.

A major magnet for such enterprises is the European Economic Community (the Common Market of the six Continental nations, now more than 1½ years old). Except for a British paper company acquiring a Scandinavian pulp mill, to add to its basic supply resource, there is no evidence as yet of such activity on the European Free Trade Assn. (the Outer Seven nations, soon to welcome an eighth, probably Finland).

A late report is that one of the biggest American paper companies is going to move into Italy, probably in the vicinity of Rome. Not International Paper or Scott Paper, which are already there. Also a large American company is talking serious business with one of the six or seven biggest paper firms in France. And this isn't Kimberly-Clark, already linked with three French companies in different locales. In Germany, International Paper Co., Kimberly-Clark and Container Corp. of America all have plants or manufacturing agreements.

It isn't just in Europe that these international manufacturing ventures are coming into being. For instance, there is the Bowater (England)—Albert E. Reed (England)—Tasman Pulp & Paper Co. Ltd. enterprise in Kawerau, New Zealand. Then of course, there is the Japanese dissolving pulp mill now operating in Sitka, Alaska, with a minority American interest.

St. Moritz Holding Co.

Last month in this magazine, the news was published of Bowater Paper Corp.'s acquisition of a controlling interest in St. Moritz Holding Company, which controls two large French mills and other paper-lumber properties. This is still being discussed as one of the most exciting events of this pe-

riod in Europe. On July 1, a new board was elected with Sir Eric Bowater as its chairman. Under Swiss law, a majority of members must continue to be Swiss citizens. The stock is again strong. It had slipped badly in the course, but the strong recovery under new ownership is evidence of confidence in Bowaters and also in future for papermaking in France.

An interesting fact is that Société F. Béghin, one of the three leading paper companies in France, also is about a 30% owner of St. Moritz. Bowaters owns 51%. But these two companies are both prominent newsprint producers in Europe, and therefore competitive. And one of St. Moritz properties is Papeteries de la Chapelle, a principal competitor of Béghin in newsprint in France—both have new high speed Beloit newsprint machines. With 60% of Bowater business in newsprint and its other increasing investments in the Common Market area, this has created a rather bizarre situation. It is believed by some observers here that Bowater and Béghin might reach an agreement regarding the latter's shares, but nothing has been announced.

Weyerhaeuser Enters Belgium

A new European company, Weyerhaeuser S.A., has been recently formed by Weyerhaeuser Co. and Intermills S.A. of Brussels, Belgium, to make corrugated shipping containers.

Intermills S.A., a group of leading Belgian paper companies, has six mills in Belgium. A modern shipping container plant is under construction, with production expected in 1961.

Other Combinations

A two million £ sterling offer by Albert E. Reed of Britain for the whole of the shares of Paper Products (Holdings), an Australian manufacturer of corrugated boxes and other paper packaging, is another important international development in movements of paper companies beyond their national borders.

The Bowaters' partnership with Scott marches on. Whenever there is an opportunity to join forces with a reputable, sound establishment in any country, Bowater-Scott will be interested. Papeteries de Belgique in Belgium, Cartiere Burgo, in Italy—each

the outstanding leader in its country—are excellent examples of Bowater-Scott partners. A tissue mill in Australia is another of their enterprises, and Scott has expanded in Latin America in two countries and possibly will move into others. Bowater, meanwhile, has a packaging plant in Ghent, Belgium, a corrugated box plant in Genoa, Italy, and now is most recently interested in carton manufacture in Rheims, France.

Britain Seeks Opportunities

In Britain today the demand for all kinds of paper, and particularly packaging papers, paperboard, tissue, and some other grades are high. The demand was very strong at midyear. But with the EFTA agreement coming into effect in midyear, providing for reduction in duties on Scandinavian kraft paper and board imports, the British industry seems to have decided it is time to look for new opportunities abroad. At home, prices were becoming more competitive. It should be remembered that the British paper industry was officially strongly opposed to EFTA but to no avail.

British manufacturers are looking for openings in countries where packaging is less advanced and there is chance for growth, to offset what might be losses in the home market. This explains the British activity abroad—more active at this time than that of any other country. While Bowater-Scott are building a tissue mill near Melbourne, Reed and Bowater are substantial shareholders in Tasman Pulp and Paper Co., where a second newsprint machine is to be installed.

The British companies are not overlooking their raw material supply. Bowater is already owner of pulp mills in Norway and Sweden, which are being expanded.

Reed, in conjunction with Sande Tresliperi A/S of Oslo, is to erect a pulp and paper mill at Sande, Norway, for producing hardwood pulp and corrugating medium. Initial capacity is to be 30,000 tons a year. Reed is the biggest producer of corrugated fiber boxes in Britain.

There is a possibility that other British manufacturers will follow in similar steps to those taken by Bowater and Reed.



FROM SODA TO KRAFT. This is S. D. Warren's Cumberland Mills, Maine mill near Portland which switched to 100% kraft mill in March, 1960.

Kraft Paves Way For Expansion

Changeover from soda to kraft pulp at S. D. Warren boosts pulp strength. Cost is low and odor has been eliminated

By MAURICE R. CASTAGNE
Eastern Editor

● S. D. Warren Co. is now producing kraft pulp at its Cumberland Mills, Maine operation. As a result, wood yield has been boosted by 10%; hardwood pulp has increased in strength from 33% to 38% (using purchased long-fibered pulp as a basis of 100%); pine strength has increased from 58% to 94%. Brightness is up 3 points. The company is now using 15% less purchased pulps, has reduced purchases of the more expensive pulps because of this strength increase. Its own hardwood production has increased 19 tons; pine production, 8 tons.

The big advantage is that S. D.

Warren can now better integrate its pulp and papermaking operations using additional local woods, making it more favorable to expand paper production at Cumberland Mills.

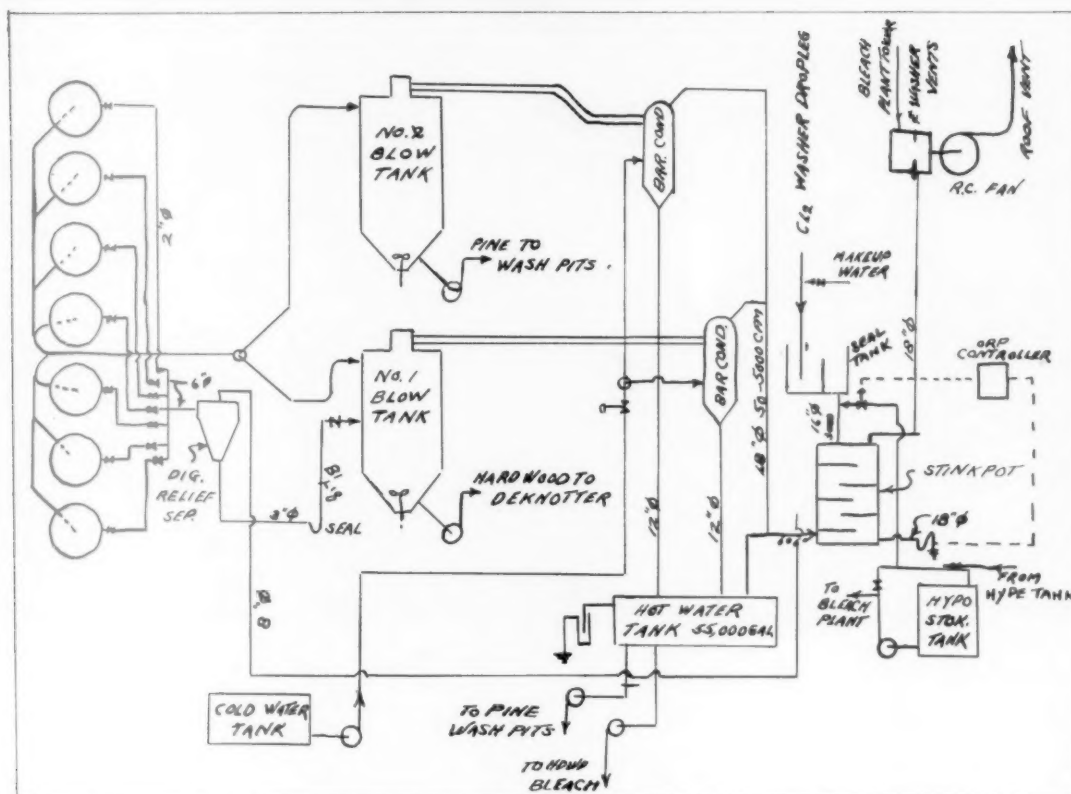
Although Warren has been producing soda pulp for 75 years and making a good short-fibered pulp from local hardwoods, the soda process was not good enough to produce a long-fibered pulp from such local softwoods as pine, hemlock and chips from sawmill waste (annual use of sawmill waste chips is about 30,000 cords). In fact, explains Rudolph T. Greep, vice president and mill manager, local pine cooked by the soda process is only a little over 50% as strong as Canadian pine cooked by the kraft process.

Community Relations Considered

The company came to the conclusion that if it wanted to expand in Maine, it had to make more pulp in Maine and only kraft pulp could give it the necessary strength. But the company was worried how its neighbors in such a built-up community would react to the kraft process. The mill is only four miles from downtown Portland, Maine, a well-established residential and business area. But expanded pulp and paper production would mean more employment, more wages and more money spent in Portland.

The company decided to seek advice of community and business leaders. But first, its engineers visited most of the kraft mills on the conti-

... S. D. Warren Goes to Kraft



DIGESTER BLOW-FLOW shows S. D. Warren's system for odor elimination.

nent having an odor reduction system. From what it saw, it knew it could install a system that would remove better than 90% of the kraft odor. Armed with this knowledge, the company had a session with the community leaders and businessmen. It asked their advice on how to present its program. The group was in 100% agreement that the kraft process was necessary. They told Warren that it was not a question of doing it, but of handling it the best possible way.

Warren was advised to put all emphasis on the positive changes and the expansion phase with the increase in jobs, new income for the area and to bring in the odor problem as an adjunct to it. They said Warren should not be apologetic about it.

In the next step, Warren mailed a folder to some 6,000-7,000 neighbors outlining its planned expansion. Newspapers and radio gave the company favorable coverage. The decision to switch to kraft was made in the fall of 1959. The kraft mill started

up March 14, 1960.

Kraft Pulping

S. D. Warren is using a standard kraft cook in 7 existing digesters, 3800 cu. ft. capacity. Cooking time, cover to cover, is about 4½ hours; 3½ hours from start of steam. Operating temperature for kraft has dropped about 10 pounds, is now 105 psi for kraft, compared to 115 for soda. Impressive is that Warren adds two thirds of its makeup chemical as soda ash instead of salt cake due to the low sulfur losses to hold the sulfidity down to 23%. The Chemi-Pulp (Howard Smith) black liquor oxidation system is being used and Warren is getting 100% oxidation of sulfides by its testing method.

How Odor is Eliminated

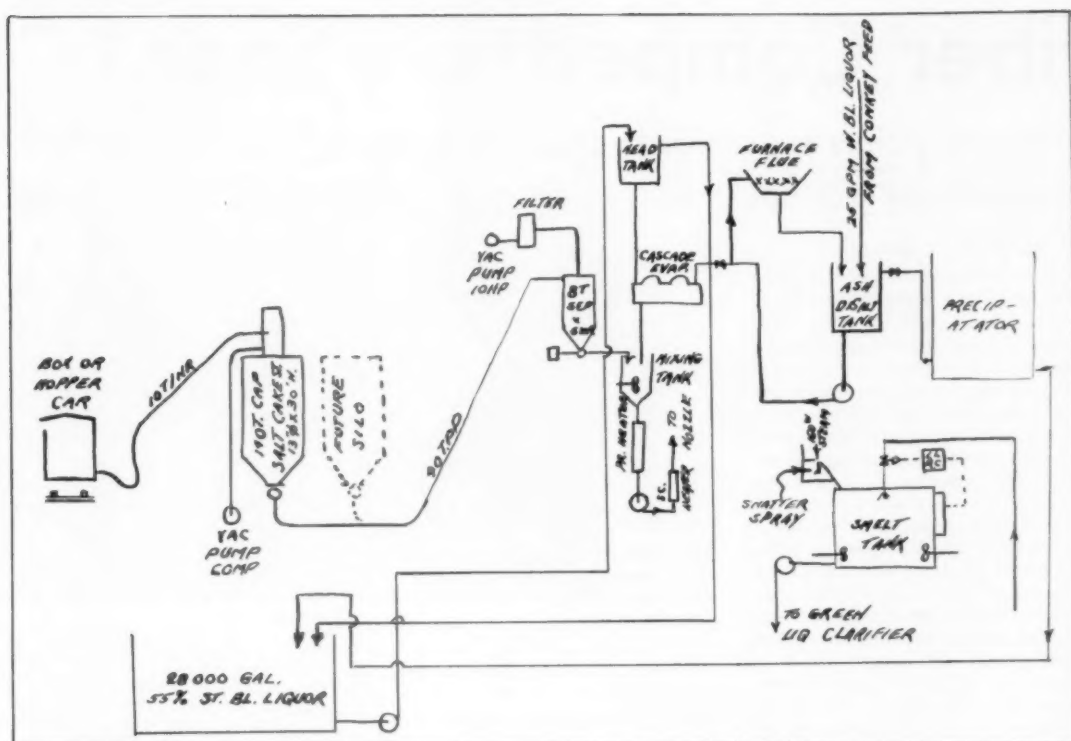
During three days spent in the Portland area, this editor noticed no odor from the Warren mill. Even the mill itself does not have the typical kraft odor.

Heart of the odor reduction system

is a non-condensable gas scrubber. Warrenites are more to the point, they call it the "stinkpot." This is a wooden tank, 12 ft. high by 8 ft. dia. All foul gases from the digester are fed to the bottom of the tank. 2,000 gpm of chlorine washer effluent flows by gravity through a series of perforated contacting plates in the scrubber. The residual chlorine in the effluent water is adequate to oxidize the odor, explains Robert W. Hisey, chief engineer. There is no kraft odor in the sewer effluent.

The use of chlorine washer water was borrowed from Weyerhaeuser Co., the idea of the scrubber, from Potlatch Forests, Inc. Warren added some innovations of its own. Putting the scrubber tower under a slight negative pressure was one.

Accumulators or heat exchangers are not used. Without the accumulator there is no foul water going to the sewer. Hot water recovered from the barometric condenser is used for pulp washing. To keep foul odor out of this water, the digester relief and



RECOVERY FLOW in S. D. Warren kraft conversion.

blow lines are separate. The relief lines are fed to a separator where the black liquor is recovered and sent to the blow tank. The uncondensed foul gases go to the scrubber.

There is no steam leakage during blows. Everything is dead-ended to avoid odors. The chlorine washer water condenses in the scrubber and acts to keep the scrubber under a vacuum. To keep a slight negative pressure, there is an induced draft from a rubber-covered bleach tower vent fan. Since the stinkpot can handle up to 5,000 cfm peaks, it is not necessary to use a gas holder or surge device, and so it is possible to keep a slight vacuum on the system. To make sure that there is sufficient chlorine in the effluent water, there is an ORP cell on the effluent from the tower which controls the hypo make-

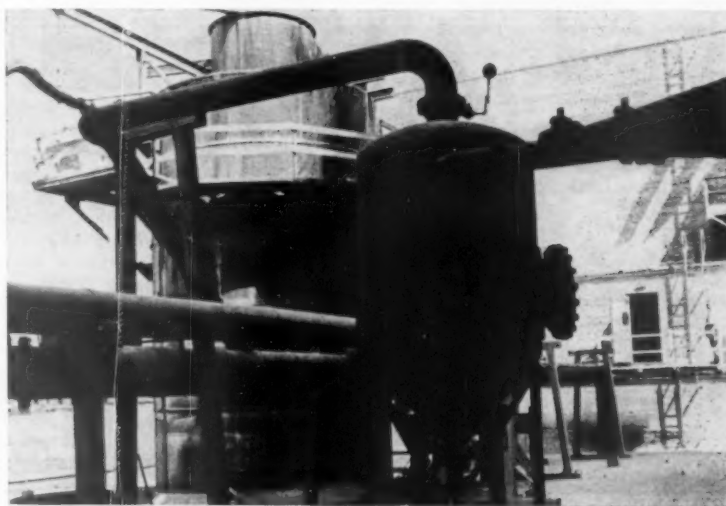
PULP & PAPER THANKS

The S. D. Warren Co. for their cooperation in preparing this article on their kraft changeover. Special thanks are due to Rudolph T. Creep, vice president; Robert Hisey, chief engineer; Al D. Wilson, editor, "The Warren Standard"; A. A. "Sam" Mann, supt., technical services and C. N. "Carl" Loveland, engineer.

up line.

Warren is also impressed with the fact that even after shutting down the four rotary black liquor furnaces and handling the full load with the Combustion Engineering recovery boiler, it can still get extra pulp tonnage.

By converting to kraft they have greatly increased their capacity to handle black liquor. Kraft has reduced the load on their recausticizing system and lime kiln. Solids in the black liquor have gone up which reduced the load on the evaporators.



DIGESTER RELIEF LINES and blow lines are kept separate to keep foul odor out of water used for pulpwashing. Digester relief lines are seen entering from right to separator where black liquor is recovered and sent to blow tank in rear.

Fiber Competition Seen

Mr. Ritchie points to possibility of use of grasses in U.S., also synthetics, but concludes woodpulp will remain basic primary fiber

By JAMES L. RITCHIE*
Executive Director, United States
Pulp Producers Association, Inc.

• Improvements in pulping processes have opened vast new sources of primary fiber supply. As the supply of primary fiber expands, there will be commensurate increases in the potential supply of secondary fiber.

Overall fiber supply should be ample to support the maximum foreseeable growth in paper and board requirements for at least a full generation ahead. That is perhaps as far ahead as domestic paper producers have ever before been able to view with confidence their long-term fiber prospects.

The range of fibers available for papermaking will also be wider. Simultaneous or parallel expansion of all available fibers is unlikely. In procurement planning, management usually concentrates its development funds and its energies upon these materials that hold the greatest promise of short-term economic gain. Relative costs will determine which fiber gets priority in expansion programs. Economics alone will decide the place in line of other fibers suitable for use in paper manufacture.

Primary vs. Secondary Fiber

Primary fiber includes all virgin fibers used for the first time in pulp and paper manufacture, such as wood, straw, reeds or grasses. It includes certain reclaimed fibers, such as cotton previously used in textile manufacture and hemp previously used in the manufacture of rope; and, on a limited scale, synthetic fibers.

Secondary fiber includes fiber suited for a second use in pulp and paper manufacture. As so defined, secondary fiber includes only waste paper.

Of the total volume of fiber currently used in U.S.A. paper and paperboard manufacture, about 74% is primary fiber and 26% secondary fiber.

The search for a more abundant primary fiber has been a recurrent



MR. RITCHIE who points out that wood must expect increasing competition from other faster growing papermaking fibers.

theme in the industry's history. It will continue to be a dominant theme. The same basic forces that have motivated behavior in the fiber economy in the past will motivate behavior in the future.

The grade pattern of woodpulp consumption in U.S.A. paper and board manufacture has been altered significantly by recent growth trends. Kraft constitutes 60% of total woodpulp consumption, compared with 43% in 1946; sulphite, 12% compared with 26% in 1946; semichemical, defibrated and exploded, 13% compared with 9%; soda pulp, 2% compared with 4%; groundwood, 13% compared with 18%.

As new types of woodpulp have assumed greater importance in the papermaking furnish, new varieties of secondary fiber have also become available for salvage.

Pulp qualities have also improved significantly in the post-war period. Bleaching facilities have expanded more rapidly than pulping facilities. While capacity for paper-grade kraft has increased about three-fold in the post-war period, maximum bleaching facilities in the kraft segment have increased more than five-fold. Capacity for paper-grade sulfite has increased in the U.S.A. by 16% in the post-war period; bleaching capacity in the sulfite segment has increased by 86%.

Post-war developments have accordingly strengthened the foundations of the domestic fiber economy. The goal of continental self-sufficiency

in fiber supply was realized by the mid-fifties. The balance of overseas trade has shifted steadily in favor of North America; overseas imports are no longer essential to our economic welfare—overseas exports are growing. Pulp and paper markets, as a result, should be less volatile, more stable, than they have been.

Since more than three-fourths of U.S.A. total woodpulp capacity has been installed within the past 25 years, existing facilities, for the most part, are modern and highly efficient.

A significant proportion of the cost of this new capacity has by now been written off.

In price, therefore, as well as in volume, variety and quality of product, American pulp and paper producers are now better equipped to compete in world markets than they have ever been.

More than any other single factor, a constant widening of the species base, made possible by improvement in pulping processes, has been responsible for the favorable growth rate in fiber. Post-war progress in the use of hardwoods, for example, has completely altered the economics of pulp and paper production in the North; just as pine did in the South and Douglas fir in the West. Not long ago, pulp producers in the Northeast and the Lake States were seriously concerned about their long-term fiber outlook; the local supply of softwood was not adequate to support further expansion, and there was growing fear that a significant part of the two million or more cords of softwood imported annually from Canada might be withdrawn. Research, directed toward the use of available hardwood, solved the North's problem. The practical results of Northern research are now benefiting other regions of the United States, particularly the South, and other pulp-producing countries around the world.

Other factors have contributed significantly to the growth of basic wood pulp supply. Among them are:

(1) Improvement in forest management practices, with emphasis on planting and care of trees; on protection against fire, bugs and disease; on clear cutting with a minimum of fiber left on the forest floor; on mechanization of cutting and handling;

* (Excerpts from a talk by James L. Ritchie, Executive Director of the United States Pulp Producers Association, Inc., at Waste Paper Symposium held in Chicago, Illinois, June 7, 1960.



WOOD FIBER is primary basic papermaking fiber, but although plentiful in North America, Scandinavia and U.S.S.R. it is scarce in some other countries. U.S. companies use latest scientific developments to protect their lands. This photo shows one of Weyerhaeuser Co.'s forestry dept. planes which are used for aerial mapping, locating roads and logging areas and other forest management programs.

on educational programs to improve forest practices of independent forest land owners; and on improved public relations.

(2) The integration of wood procurement programs in the forest product industries: On a growing scale, the waste wood generated in the manufacture of other forest products is being converted to chips for use in pulp and paper manufacture. A major share of the post-war expansion of pulp facilities on the West Coast and much of the recent expansion in the South has been based on this use.

(3) Improved methods for processing roundwood: Hydraulic barkers on the West Coast, for example, have improved wood utilization 15%.

(4) The changing pattern of overall wood consumption: Of the total volume of wood consumed in industrial forest products of U.S.A., pulpwood an estimated 30%. Pulpwood constituted 2% of the total in 1900, 4% in 1910, 8% in 1920, 16% in 1930, and 26% in 1950. ("Timber Resources for America's Future," U.S. Forest Service, January 1958, at page 372).

Consumption of primary fibers other than woodpulp (rags, linters, rope, reeds, straw, grasses and synthetics) totalled about one million tons in 1959, or about 4% of the total primary fiber consumed in domestic paper and board manufacture.

Relative consumption of these pri-

mary fibers has declined steadily throughout this century. Average consumption per ton of paper and paperboard produced totalled 454 pounds in 1904, 258 pounds in 1929, and 63 pounds in 1959.

The consumption of rags, once the basic primary fiber, rose from about 300,000 tons in 1904 to a peak of about 740,000 tons in 1929. Current consumption is back to about 300,000 tons, the point of departure some 55 years ago.

Rags, in recent years, have had two major outlets in the United States paper industry: (1.) fine papers (2.) building papers.

The introduction of synthetics to textiles has raised the cost of collecting, sorting and processing rags for fine paper manufacture. This and other cost factors have obliged producers to limit production of 100% and 75% rag-content papers, and to increase production of 25% and 50% rag-content grades. On an increasing scale, lower cost chemical wood pulps of improved quality have been substituted for rags.

Cotton linters are also making inroads upon rags in fine papers. The availability of linters pulp for this purpose has increased, because linters pulp has been steadily losing ground to dissolving wood pulp as a raw material for rayon. Economics may continue to favor a growing substitution

of linters for rags in fine papers. It is unlikely, however, that the present supply of linters pulp will be significantly expanded in the foreseeable future.

In building papers, rags have been giving ground to wood pulp on an even larger scale. Growth has been based primarily upon defibrated wood pulp, a high-yield, low-cost mechanical wood pulp that has had a sharp rate of growth in the post-war years.

It is probable that the relative importance of rags as a raw material for papermaking will continue to decline—unless, of course, technological progress can some day open the door to unrestricted use of reclaimed synthetic fibers.

Consumption of old rope in U.S. paper and board manufacture is limited to five or six mills in the manufacture of condenser and electrical insulation papers. Nylon has been supplanting hemp in rope manufacture, and woodpulp has been replacing old rope in paper manufacture. Significant increases in the availability of this type of fiber are unlikely.

Consumption of reeds, straw and grasses in U.S.A. paper and board manufacture is totalled about 600,000 tons in 1959. Consumption declined by about 30% since 1950, with woodpulp picking up most of the loss.

Reeds, straw and grasses (wild vegetation or crop residues), are a tremendous reservoir of potential fiber supply for the paper industries of the world.

In many other countries, where there is no indigenous wood supply or where suitable wood supply is inaccessible or inadequate, local industries based upon reeds, straw and grasses are growing and prospering. In Latin America, in the Philippines, and in Cuba, the number of operations based on bagasse is increasing. In Thailand, Pakistan, Burma and the Philippines, bamboo is being used on an increasing scale. Straw is used extensively in France, Italy, Spain and Holland, and new operations are planned in Yugoslavia, Hungary, Egypt, Iraq and Israel. Britain uses about a quarter of a million tons of esparto grass in fine paper manufacture. New mills based on papyrus are being planned in Egypt and Israel. Russia is currently building mills that will more than quadruple its consumption of reeds; significant increases in the consumption of reeds are reportedly taking place in France, West Germany, Iraq, Egypt and Rumania.

For the most part, overseas development programs looking toward increased use of reeds, straws and grasses are being undertaken by in-

... Fiber Competition

dustries that enjoy protection against the competition of wood pulp. As long as these programs are insulated against competition, progress toward realization of the full economic potential of these fibers for papermaking will be slow. Ultimately, the true value of these fibers must be tested in free and open competition with wood pulp. The ultimate test could well take place in the U.S. market.

The United States is richly endowed with these materials. This country is a major producer of agricultural commodities; crop residues are consequently abundant. So, too, is wild vegetation. The common reed, for example, grows abundantly from Maine to Florida. K. Chester Starr, vice president of the Chemurgic Council and chairman of its technical advisory committee, reports that the common reed grows from 6- $\frac{1}{2}$ to 30 feet high and produces from 3.7 to 7.4 tons of dry matter per acre per year, far in excess of the maximum yields that can be expected from wood. It has long fibers, a high percentage of cellulose, and no more lignin than hardwoods. Sawgrass covers a million or more acres in the southern everglades, palmetto covers wide areas of southern wasteland, tidewater rushes are abundant in the Mississippi Delta area, and Johnson and Sudan grass in other parts of the Southern states of U.S.A.

Mr. Starr summed up an article on Annual Fibers, published in the June 1959 issue of the Chemurgic Digest, "Some day these waste fibers of the Southland will be highly valued, and papermaking is their most likely market. When this will come about, whether it will be soon or far in the future, depends upon the comparative economics of these fibers versus wood. The time may be sooner than we think..."

The tempo of American research is being stepped up in this field. A February report of the Agricultural Research Service of the U.S. Department of Agriculture, examines the suitability of 58 fiber-producing plants for paper manufacture. As the tempo of research is stepped up, the economic gap between reeds, straw and grasses, on the one hand, and wood pulp and waste paper on the other, may be narrowed.

We doubt that consumption of reeds, straw and grasses in U.S. paper and board manufacture will show significant gains in this decade. Woodpulp and waste paper are too well entrenched as papermaking fibers to permit a sudden breakthrough by

other natural fibers, particularly those that present difficult problems of collection, storage and use. It is conceivable, however, that the ten or fifteen years progress in the collection and use of these fibers will so alter the economics of fiber supply that these fibers will be attractive to domestic papermakers.

Synthetics

It is also conceivable that synthetics could become a serious competitor for papermaking fiber. Synthetic fibers have been tried experimentally in the paper industry; on a limited scale, there have already been commercial runs. As is always true of any new commercial product, costs are high. It must be anticipated, however, that, as problems are solved, qualities will improve and costs decline.

Cost reduction through technical progress and mass production is standard procedure in the chemical industry. Nylon hose, for example, are currently sold at about one-tenth the price at which they were originally offered; the price of nylon tire cord was reduced by \$420 per ton between August and December of 1959.

If the chemical industry seriously sets its sights upon the market for papermaking fiber, the character of that market could be significantly changed in a relatively short time. Man-made fibers currently account for 29% of total domestic consumption of textile fiber; thirty years ago, these fibers accounted for only 3%. It would be significant if the fiber markets of the paper industry should begin to encounter similar competition from synthetics.

It seems unlikely that this will happen within the next decade. However, the customary approach of the chemical industry is one of sudden breakthrough, rather than of cautious evolution.

If synthetic fibers become a significant factor in paper manufacture, the problems of paper salvage will be more complex. Today's salvage problems relate primarily to the rejection of what the British call "pernicious contraries" i.e., plastics, resins, glues, waxes, inks, etc. The rejection of synthetic fibers, as distinct from "pernicious contraries," could, in due course, become too costly to be economic. The ultimate economic solution might call for action far more complex than mere "sorting." At some point, processing techniques may have to be devised that will permit the effective use of reclaimed syn-

thetics. If it proves feasible to process synthetics as a primary fiber, it should also prove practicable to reprocess them as a secondary fiber. While the development of suitable processing techniques may be costly, failure to take timely action, if action is required, could prove even more costly.

Secondary Fiber

Relative demand for waste paper rises when the domestic supply of primary fiber fails to keep pace with the growth of requirements, and falls when primary fiber capacity expands more rapidly than requirements.

The U.S. salvage rate for waste paper is lower than it has been in the past fifty years. Conversely, idle reserve "capacity" in waste paper is at its highest level in fifty years.

Production of waste paper at maximum practicable "capacity," as measured by peak historical performance, would result in an annual supply of 13.7 million tons. Actual recovery is currently at an annual rate of 9.2 million tons. "Idle" capacity in the waste paper segment, accordingly, totals 4.5 million tons. Current operations on this basis are at 67% of maximum practicable "capacity."

A reasonable reserve supply of secondary fiber is useful. It provides the paper industry with a flexibility it would otherwise lack. The long lead time for the expansion of primary fiber capacity provides no such flexibility. Idle woodpulp capacity is a luxury that the industry can ill-afford; a reasonable reserve of idle waste paper "capacity" is a form of insurance that the industry can and must afford if it is to enjoy the flexibility it needs in raw material procurement.

To the strict conservationist, failure to recover this available fiber is a waste of valuable resources. To the practical business man, however, this is not waste, but a natural incident of product selection in a free economy. In industry, strict cost accounting principles must govern procurement policies as well as sales policies. Competitive pressures compel management to be pragmatic in such matters.

Such dilemmas have a way of resolving themselves. Raw materials that are economically impracticable today become economically practicable tomorrow. The relative economics of fiber supply are never static. This has been demonstrated again and again in the industrial economy.

Waste Wood

One of the most recent examples of policy reversal management is to be found in woodpulp. Waste wood refuse from other forest product in-



BAGASSE has sweetened the fiber cup for many wood-scarce nations, has had commercial success in Latin America, particularly Peru at the W. R. Grace Paramonga mill. Shown here are giant sugar cane crushers at Grace's 3,200 metric ton sugar cane mill.



ANNUAL FIBERS may be key to offset any fiber shortages that may develop. The U. S. Dept. of Agriculture is already making studies of such plants. In Israel, this United Nations photo shows workers de-seeding locally grown flax straw for a paper mill.

dustries has been in abundant supply in this country. It was not until after World War II, however, that it became economically feasible for the industry to collect, transport and use

this waste on any significant scale. Once the economic justification for this raw material was proven, reliance upon this fiber grew by leaps and bounds.

In similar fashion, the cold economics of fiber supply will some day dictate a sharp rise in the waste paper salvage rate. A significant proportion of the potentially available waste paper supply currently represents a costly disposal problem; at some point, this liability will become a valuable asset in the fiber economy. How soon, depends upon the development of any number of economic factors, most of them beyond the immediate control of management.

Our own guess is that the economics of expansion, and of raw material supply for expansion, will continue to favor virgin wood pulp over secondary fiber for at least the balance of this decade. While physical consumption of waste paper should continue to increase over the next decade, significant growth in relative reliance on waste paper may be delayed until sometime after 1970.

Fiber Prospects Summarized

To sum up, 96% of U.S.A. paper and paperboard production is now based upon wood fiber, virgin or reclaimed.

For the next decade at least, growth in paper and board production will be based upon wood fiber, virgin or reclaimed. Woodpulp will probably continue to make relative gains at the expense of waste paper.

At some point after 1970, it is possible that the economics of fiber supply will begin to change. As this happens, the pattern of growth in the fiber economy will also change. Some day, certainly, domestic wood pulp will encounter more intensive competition from other fibers. Technological progress will determine, in due course, the nature of this new competition.

If U.S.A. woodpulp tends to become either scarce or costly, it is possible that the paper industry, geared as it is to the use of wood fiber, may once again look first to foreign supply sources to supplement its domestic fiber supply. The most likely source of supplemental supply could, in due course, turn out to be South America. South America has more forest acreage than North America, and a faster growing cycle.

It has recently been reported that a Eucalyptus plantation in Brazil will grow more fiber in five years than a plantation of spruce or pine can grow in twenty. At some stage, if political climates become more favorable, private capital from the U.S. may begin to flow Southward, with a three-fold

objective in view:

1. The establishment of forest plantations
2. The development of Latin American pulp and paper markets
3. The production of an exportable supply of captive wood pulp that can be delivered to a parent company in the U.S. at a price no higher than the then-prevailing cost of U.S. wood pulp production

Until conditions are ripe for the simultaneous achievement of all three of these objectives, South America is not likely to become a serious competitor in the U.S. fiber economy. Within thirty years, however, we believe that this type of competition could well materialize on a significant scale.

More imminent, perhaps, although in our judgment still at least a decade off, is the prospect of growing competition from other primary fibers. Of these, the most promising appear to be reeds, straw and grasses, on the one hand, and synthetic fibers on the other.

Secondary fiber will continue to compete against primary fibers. In volume, variety, quality and price, waste paper is steadily becoming more attractive as a papermaking fiber. The lower the salvage rate, the greater the relative economic appeal of waste paper. At some point, perhaps a decade hence, the downswing in the salvage rate will be reversed, and waste paper will become a factor of increasing relative importance in the growth of the domestic fiber economy—for a time.

We stress "for a time" because one of the major functions of the waste paper segment, historically, has been to cushion swings and shocks in the overall fiber economy. Waste paper, in all probability, will continue to serve as the fiber economy's built-in stabilizer. In the performance of this function, the waste paper segment may be subject almost continuously to stresses and strains. For this reason, volatility could well continue to be a characteristic feature of waste paper trade.

Finally, a favorable growth rates in the waste paper segment may be contingent upon one other factor—namely, more aggressive research. Changes in the physical and chemical characteristics of primary fiber supply could conceivably be far more revolutionary in the future than they have been in the past. Producers and consumers of waste paper, to remain competitive, must be prepared to meet any challenge that revolutionary changes in the nature of primary fiber supply may present.

Bowaters Goes For Board... With First Major U.S. Eastern Mill



BOWATER'S BID: Smooth on both sides, lighter in color, compatible to wood (compared to a competitor.)

A world leader in forest products, Bowaters has diversified new production center with newly developed hardboard process

FACTORS WHICH MAKE THIS A SIGNIFICANT MILL:

1. First major board mill in eastern U. S.
 2. One of largest in country, costliest in World.
 3. Produces hardboard smooth-on-both-sides at a competitive price.
 4. Uses newly developed air process.
 5. Initial production from mill will go to furniture industry.
 6. Has fastest production cycle of any hardboard mill in world.
 7. Has daily capacity of 500,000 square feet.
 8. Use of 50,000 cords of hardwood a year makes it an attractive means for pine-hardwood management.
 9. Marks first Bowaters diversification move in U. S.
 10. Maximum power consumption is 5,000 kw. produced at adjacent pulp mill.
 11. Woodyard serving pulp mill is also designed to handle hardwoods for new hardboard mill.
 12. Plant was designed by Bowaters Engineering and Development Inc. and tested in Oregon pilot plant.
 13. Entirely new sales organization will market it.
-

By **WILLIAM F. DIEHL, JR.**
Southern Editor

● Hardboard—a highly versatile wood product composed of wood particles—has been struggling for acceptance in the U.S. since the end of World War II. It has gradually gained a significant foothold in American markets. Nonetheless, last year American per capita consumption only reached 13½ pounds while in Europe per capita use of this product had soared to 65 pounds. Quite obviously the American market invites tapping.

One of the newest to take firm steps toward developing this market is the Bowaters Organization. In its first move toward diversification of its American production facilities the interminable British firm has established a new mill, a new product and a sweeping sales force, all in one pop of the bag.

Bowater Board, the product, is in full production at the new Bowater mill, adjacent to its relatively new pulp-soon-to-be-paper mill outside Catawba, S.C. It is the first major hardboard mill in the Eastern U.S. and as such it bucks headlong into a market which has been dominated by Scandinavian imports. The big names



WITH 500,000 SQ. FT. CAPACITY, new Bowater Board Co. mill represents formidable eastern competitor.

in U.S. hardboard production Bowaters feels, have developed sales prestige in the middle, south and far western U.S.

While some observers in the hardboard industry have questioned the soundness of locating a mill where import competition is keenest such a move is typical of the organization and its top man, Sir Eric Bowater. He was a onetime professional soldier whose World War I wounds altered the path of an aggressive and vital personality from soldiering to industry. Assuming direction of a comparatively small family paper company at the age of 32, Sir Eric has built it into a gigantic international organization with mills in such faraway places as Tasmania and diversified products ranging from fine papers to insulating board, from ocean freighters to china clay.

In 1953 the Bowater "umbrella" opened over its first U.S. production center, the newsprint mill at Calhoun, Tenn., and following an historic company policy of continuous expansion the mill (which started up with two machines and an annual capacity of 130,000 tons) shoved this figure to 430,000 tons from four machines. This entire output has been sold in advance to U.S. publishers on long term contracts.

But the creation of Bowater Board first began to take shape when the firm's second mill was completed at Catawba. The 400-ton-a-day semi-bleached kraft mill went into production ahead of schedule in mid-1959, was hardly on-stream before Sir Eric

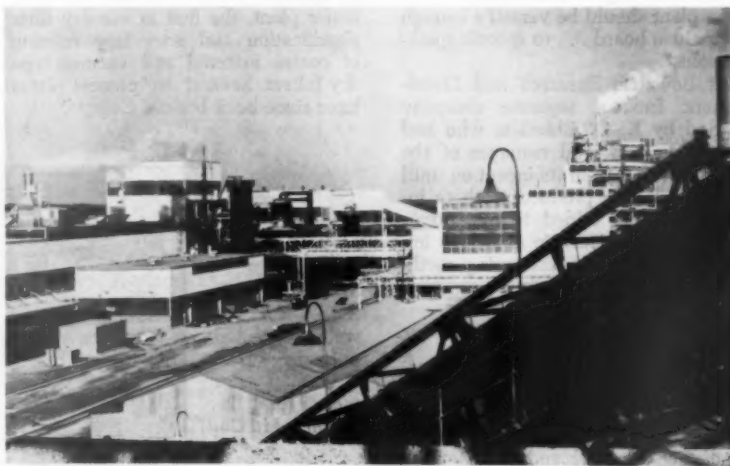
announced immediate plans for installation of a paper machine. At the same time, diversification of American facilities was already in the offing. The hardboard mill was under construction.

Bowaters has been in the hardboard field in Europe for 30 years, producing board at two mills, one in Kildare County, Ireland, the other at Kemsley, England. But it has been the company's theory that a hardboard mill is not economically feasible unless it can be tied in with another plant.

The pulp mill's woodyard, power plant, wood procurement staff and purchasing facilities offered the perfect opportunity for such a move.

Step One: A Product

If competition with the Scandinavian foothold in the U.S. is to be a problem, Bowaters has certainly removed as much of the risk as possible. Convinced that it must produce a product sufficiently different from and, if possible, better than its competitors, Bowaters sent Geoffrey Cul-



RELATIVELY NEW BOWATER CAROLINA CORP. Pulp mill made hardboard mill economically feasible. New board mill utilizes wood handling, power, procurement and purchasing facilities.

... Bowaters Goes for Board at Eastern U. S. Mill



PART OF ECONOMY of locating new mill at new pulp mill is sprawling wood-yard which can handle all pine necessary for pulp mill, all hardwood for hardboard. Flume carries logs from either pile to debarkers; they are sorted afterwards. Board mill will utilize 50,000 cords of hardwood a year.

len, one of its directors, on a six month tour of the Eastern U.S. to determine what this market wanted.

Some of the answers determined the eventual characteristics of the product: "We want a light, pleasing color—a lot of board is too dark" . . . "Give us a board that is harmonious to natural wood" . . . "Make it smooth on both sides" . . . "It must have superior finishing characteristics" . . . "The plant should be versatile enough to produce board . . . to specific qualifications."

At Bowaters Research and Development Inc., a separate company headed by K. O. Elderkin, who had been vice pres. and manager of the newsprint mill from its inception until it was well into production, these ingredients were added to one other: Bowaters' characteristic ability to improve on latest manufacturing methods to suit its own needs.

Step Two: The Process

Two processes are used in production of hardboard. One is the "wet process" which is similar to the pulp process. Water is used as a conveying means for the fiber and it is drained on a Fourdrinier machine. The other process, the "dry process" is relatively new. The first commercial dry process mill was built in 1950 at Ana-

cortes, Wash., using a process developed by the Plywood Research Foundation. The second installation by the Coos Bay Lumber Co., Coos Bay, Ore., dried the fiber to a lower moisture content thereby eliminating the need for screening during the press operation and permitting production of a smooth two side board directly from a fiber mat. Weyerhaeuser's mill at Klamath Falls, Ore., was the third major plant, the first to use dry fiber classification and secondary refining of coarse material and vacuum-type dry felters. Several dry process plants have since been built in Europe.

One obvious advantage of the dry process is the lack of any pollution problem. Another is that it requires a lower capital investment. Bowaters was in the unique position of already having water treatment facilities so it was able to make an objective choice.

Two top men in the hardboard field helped make these decisions. One was John C. Robinson, onetime engineer and production head at Weyerhaeuser's West Coast hardboard facilities, now manager of the Bowater Board Company. The other was Joseph Hahn, who had been with Masonite, a leader in the hardboard field, for 12 years and was asst. to the general sales manager when he left to become sales manager of Bowater Board.

Result of the research and development program was a unique, patented variation of the dry process which uses high velocity air to convey the chips plus special felts, presses and other equipment. Its daily production cycle of 500,000 sq. ft. gives it one of the fastest production cycles of any hardboard plant in the world. But Bowaters is betting on its wide range of products and its production versatility for success in the field.

Step Three: The Market

"We can tailor-make board to meet critical field end uses," Mr. Robinson told PULP & PAPER, "a new time-temperature cycle permits Bowaters to ship board at the desired moisture content level obtained in manufacturing. A simultaneous closing mechanism on the press gives it a faster pressing cycle and produces a uniform board from top to bottom of the press. Density can be controlled by altering the time-pressure cycle to make board products with physical properties not even available in natu-

MARKET AREA for Bowaters pointed out by **JOE HAHN**, sales mgr. for Bowater Board Co.



ral woods. I don't believe there is any doubt that this is the costliest dry process mill ever built."

Its markets? "We'll go for all hard-board markets on the eastern seaboard," says the enthusiastic Mr. Hahn. "But first we'll aim at the furniture industry. Our research shows there are parts of this industry alone that will support an entire plant. And we're located right in the heart of this market."

Eventually they will undoubtedly look to other markets; to toys, novelties, automotive industry, card tables, small construction (the dealer market), lapsiding, carport roofing and other inviting lines.

Basically, however, Bowaters realizes that their biggest competitor is still a resistance of the public to the product. "Hardwood," says Mr. Hahn,

"has yet to be sold as a quality product. Yet it has far greater building advantages than wood. Its acceptance since 1945 has been 'explosive' but still it's far from what it should be."

Bowaters' answer is to furnish a product which meets just about all of the various requirements its research asked of it; to add new, attractive selling points which will break down resistance and promote full acceptance of board; to give its customers a broad product line and develop a dominant name in the market, along with Weyerhaeuser, Masonite and other established leaders in the field.

Mr. Hahn and Mr. Robinson feel that their smooth-two-side board with its light color and "woody" appearance will be the difference in cracking the market. It appears Bowater Board will be a formidable competitor.



MANAGER OF NEW MILL is ex-west coast engineer JOHN ROBINSON who believes product range, mill's versatility are keys to success.

Bowaters Air Process Is New Development

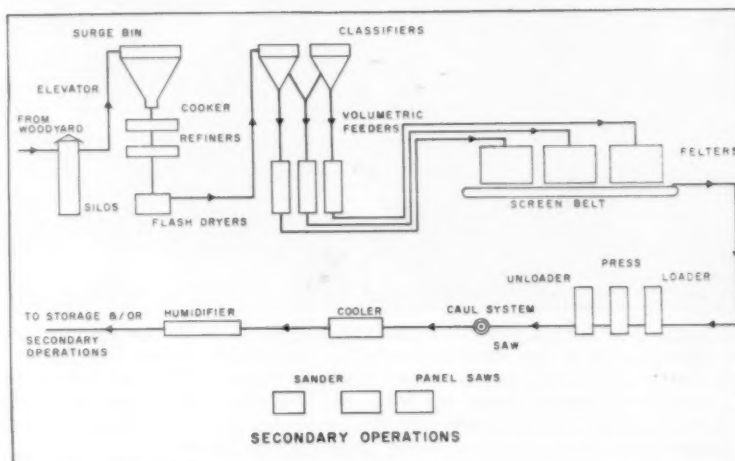
For 17 months prior to the beginning of design work on the Bowater Board mill, engineers worked to develop the product and process in a pilot plant at Coos Bay, Ore. Here, all variables of the process were checked out and new ideas developed. The first nine months were spent in developing the basic changes in existing dry processes, the following eight months in refining this process. Gum, oak and poplar from the Carolinas were sent to the west coast and Bowaters worked with various equipment manufacturers.

In the Bowater air process, wood fiber is pneumatically metered through a system of five ducts, each a separate oscillating nozzle, and then felted continuously into the desired mat width and thickness. There are two coarse-fiber volumetric feeders and a single fine-fiber stream.

These fiber streams are deposited on a moving wire that travels over suction boxes located below the nozzles. A continuous multi-layer fiber mat is built up as the screen passes through each of four sections of the felting operation. The mat is then levelled by three shave-off rolls after it has passed through the first mat, allowing the formation of a finished board with Bowaters' surface characteristics.

The plant will produce the thinnest sheet of hardboard required by the market and a thicker board than normal (up to 1/2 in.). It will also give full range of densities and surfaces.

A majority of the wood used will come from the Piedmont section of



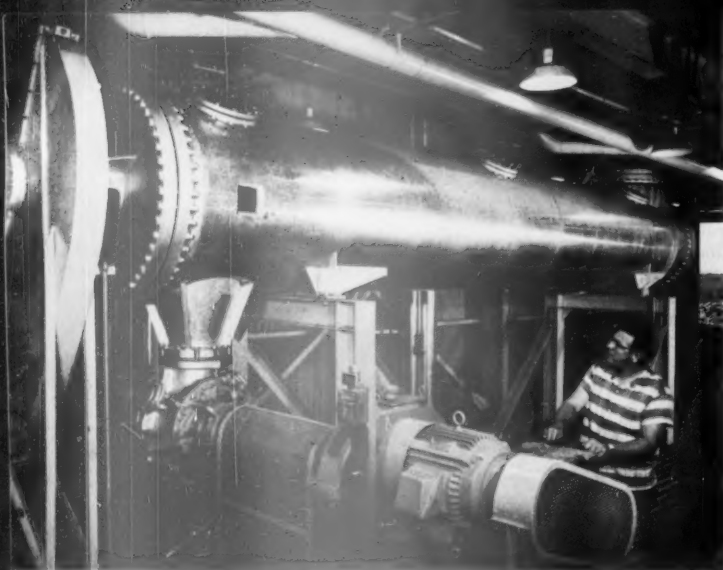
HOW BOWATER BOARD IS MADE IS shown in this diagram of entire operation. Feeders, felters, press are all new Bowaters innovations.

North and South Carolina, most of it delivered by rail. Short hauls will be brought in by truck. The Catawba Timber Co., woods organization of the Bowaters Carolina Corp., will procure all wood. With this enhanced use of hardwoods, Bowaters woodlands dept. will also have a new woodlands management tool at its disposal. While other mills in the South have been working to develop increased hardwood use in the kraft process, Bowaters has a ready-made market for its hardwoods.

From the woodyard, logs are delivered by flume and chain to one of two 12 ft. by 67 1/2 ft. barking drums

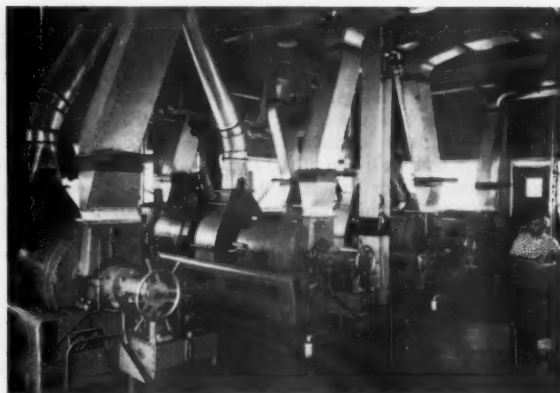
which serve both the hardwood and pine lines. They are then sorted on a 66 in. rubber belt and sent through two 112 in., 10 knife D. J. Murray chippers. A 36 in. rechipper handles rejects.

Accepted chips are blown from the screens to two 200-ton Chemical Linings tile chip silos through a specially designed Rader Pneumatics high pressure system. Link-Belt 17 ft. rotary feeders remove chips from the storage silos and carry them to bucket elevators. These feeders operate on a variable hourly capacity. Elevators dump the chips into a chip surge bin. For picture description, turn page.

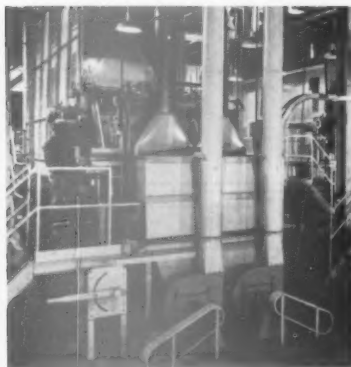


1. Chips are cooked in this American Defibrator continuous cooker. Actually chips are steamed for five minutes at 150 pounds per sq. in. The cooker feed screw draws chips from surge bin and also discharges them through a rotary valve into a distribution screw. The agitator in cooker is paddle-type and screw is equipped with variable-speed drive.

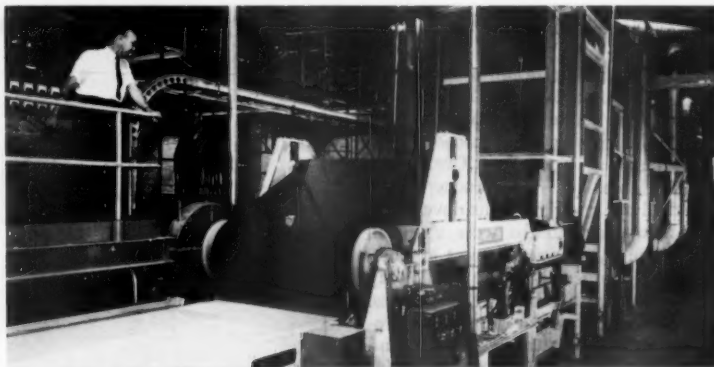
... Bowaters Board



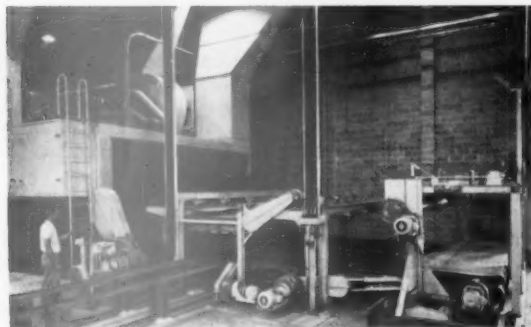
2. From distribution screw, four metering screws draw the cooked chips into one of four #411 double-disc Bauer refiners. Two 400 h.p. synchronous motors are used, one for each disc. At this point various types of resins are mixed with fibers to produce desired physical properties. Special tempering resins are added to make special thru-tempered board.



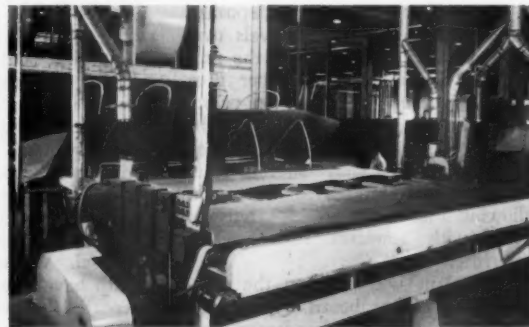
5. Volumetric feeders, actually combination storage and metering machines which collect fiber from classifiers. Feeders here are for coarse fibers, are completely automatic.



6. After fibers are metered through five separate oscillating nozzles from the volumetric feeders, they hit moving wire with suction boxes beneath and a continuous fiber mat is built up. There are four areas and in the fourth section a layer of fines is added to the mat to give it surface characteristics. Felted mat then passes through precompressing equipment. Supt. P. L. Kvale watches.



9. Once board is formed, all that remains is humidifying, sanding and sawing. Boards come out of cooling equipment and are loaded for trip to humidification tanks on transfer cars.



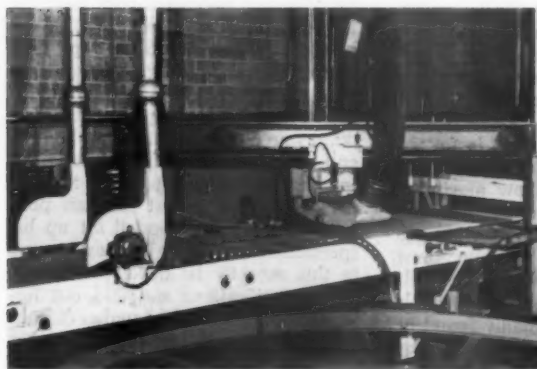
10. Trim saws cut long board lengths into approximate & size prior to the cooling step. Once cooled they are 11. ready for humidification tanks, (see picture on opposite page), for correct moisture content.



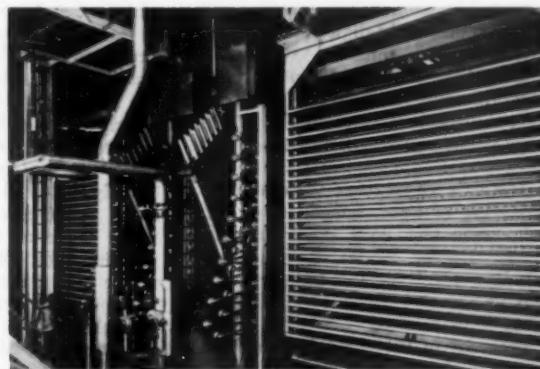
3. Heater air is blown through refiner case conveying fibers into high-temperature flash-drying equipment which is located outside the plant. Moisture in wood and water added with the resin evaporate rapidly while fiber is being conveyed. Two flash dryers are direct-gas fired and discharged into mechanical air separators where they are classified. Fine fibers go to these volumetric feeders, coarse to a separate coarse fibered feeder. Feeders are electrically regulated.



4. Prior to being fed to the volumetric feeders, chips are blown by high velocity air to these huge cyclones on roof. They are held briefly here then carried, by air blast, to volumetric feeders below.



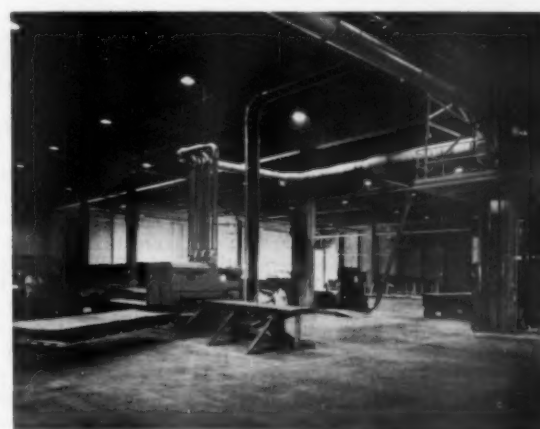
7. After mat is precompressed it passes to high speed saws where edges are trimmed and mats cut to required length before pressing. The mat lengths are then deposited in steel caul plates and taken to press charger. Edgings are carried off by Rader Pneumatics high pressure equipment. 20 mats are in press load.



8. A charger pushes a new load of cauls into press charger, (left), unloader simultaneously withdraws pressed hardboard from other side. Mats are held at pressure up to 1,000 pounds per sq. in. by a pressure of 5,720 tons. Important is simultaneous-closing mechanism which shuts openings of press faster, produces uniform boards.



12. Final step is shown in picture at right where three-belt sander which moves at 90 linear ft. per min. Board is sanded to individual customer requirements. Sander holds to caliper tolerance of .005 inch.



Quality, Low-Cost Pulp Cutting

Expert knife know-how is absolute must. Here, an experienced technician spells out ABC's of installation, maintenance

By **ROCKY LINDELL**

Consultant
Pulp Finishing, Warehousing,
Shipping
Seattle, Wash.

Specially Written for
PULP & PAPER

• Quality severance of pulp sheets became a significant factor of manufacturing with the coming of high-grade dissolving pulps. Subsequent to the early 1930s its importance has mounted by geometric progression and now assumes eight-digit yearly cost to dissolving pulp mills.

Length uniformity, clean cuts and capacities exceeding 20 tons per hour were unheard of prior to the era of large-volume production of dissolving pulp.

Methods of cutting were crude—consisting of light, improperly-driven knife cylinders with unstable knife anvils. Doctor blades, knife drives, grinding bevels, correct knife installation and maintenance received little or no consideration.

Progress in this field has been so extensive that today's modern mills—those with equipment of good design and manufacture skillfully serviced and maintained—can regularly run 75,000 to 110,000 tons of quality-cut sheet pulp on a single grinding of knives.

Formerly the general attitude of mill operators seemed to be, "if we can get the pulp sheet over the machine, we'll somehow get it cut." When the knives failed to cut, any workman with a wrench was allowed to make haphazard knife adjustments. The results were frequently inadequate and left but two alternatives: (1) shut down cutting operations and change knives or (2) alter moisture, basis weight and caliper of sheet to suit condition of the pulp knives.

Then came full-scale production of dissolving pulps and, consequently, installation of modern high-production finishing rooms. Pulp knives showed up as production-limiting factors. Techniques formerly used for cutting single-sheet thicknesses did not yield consistent, clean cuts when applied to multiple sheets. This in-

volved excessive, costly down time for knife changes.

To Get Quality Performance

With due respect to the skills of engineers, machinists and mechanics, the installation and maintenance of knives should be supervised by a person with a thorough understanding of pulp reactions and pulp-cutting requirements. He should be the one to decide what constitutes an acceptable cut and when and how the knives shall be adjusted or changed.

The bevels of grinding may be altered slightly to obtain the best possible cut and greater knife longevity. A fairly common combination that produces passable cutting under normal conditions is a bevel of 75° on the fly-knife and 80° on the bed-knife. When cutting heavy, dense sheets where cleanliness of the cut is not too important, go to 85° bed-knife and 80° fly-knife. These allow maximum metal at the point of impact and will result in more tons of cutting per grinding, especially in operations where high knife speeds are attained.

Another variation can be used with favorable results. Commonly found in departments producing dissolving pulp for vat steeping, this variation involves combining a high-carbon bed-knife with an inlaid high-speed fly-knife. The fly-knife, as the softer of the two, shows the most wear, yet is readily accessible for honing and can be dressed by hand in a matter of minutes.

How To Install Knives

Rules that should be rigidly followed when changing knives:

(1) Knives and knife channels must be scrupulously clean, insuring metal-to-metal contact.

(2) Only perfect machine screws are to be used, old battered screws avoided. The latter may have been crystallized by prior usage and snap off during operations. All knife screws are to be driven absolutely snug.

(3) Before attempting to adjust new knives, it must be known with certainty that the knife drive is disconnected and the jacks under the bed anvil slacked off. The knives should be brought into mesh very gently by manually rocking the knife cylinder as the anvil is brought forward. When



ROCKY LINDELL, author of this article specially written for PULP & PAPER, was associated with Rayonier Inc. at Hoquiam, Wash. for 23 years before resigning in 1953 as supt. pulp finishing—warehousing—storage and supt. paper warehousing—shipping. He joined Ketchikan Pulp Co. as supt. pulp warehousing—finishing—shipping and participated in laying out finishing room, selecting and training personnel of this first Alaskan pulp mill. In 1957 Mr. Lindell set up his specialized consultant business. It was in this capacity he developed equipment specifications and laid out finishing room for Alaska Lumber & Pulp Co.; subsequently trained personnel and handled start-up operations at this MgO dissolving pulp plant which inaugurated production last winter at Sitka.

the knives are barely making contact at each end, the bed-knife adjustments are to be secured and the fly-knife drive engaged. It is advisable to apply a slight amount of grease to the cutting edge of each knife and rotate the fly-knife at a medium speed for about 15 min. Both knives are then to be honed, and supporting jacks under the anvil are to be adjusted. It is next necessary to operate the fly-knife for an additional 15 min., during which time one can make whatever adjustments are necessary in order to obtain a uniformity of light contact across the cutter.

Ruin, or Adjust by Stages?

(4) Initiating new knives is an extremely critical phase. It requires the judgment of an experienced supervisor. During the first two operating hours the cut produced by the new

Essentials for Better Pulp Cutting

1. Universal method of knife installation is impossible because compensation must be made for several variables. These include sheet width, caliper, basis weight, speed and length of cut. The problem is amplified by the fact that many present day operators are lacking in training and experience.

2. Bed-Knife Anvils and Flyers. Anvils need be constructed and designed with stability to overcome flexing or sagging; they must have sturdy, adjustable supporting jacks spaced at 60-in. intervals across cutter span. The flyer is to be of heavy non-flexing design and ground to a dynamic balance; journals and bearings of sufficient size to withstand tremendous functional pounding. Knife channels must be machined to perfect alignment. Discrepancies exceeding 0.002 in. are apparent in knife reactions and

contribute to unsatisfactory performance.

3. Choosing Knives. Several manufacturers supply pulp cutter knives for the industry. Each, according to respective agents, has a superlative product. Generally, knives are furnished in accordance with specifications determined and handed down by the makers of original cutting equipment. However, conditions change over a span of years, and the original specifications may no longer be adequate.

Cardinal specifications to which knives must comply:

(1) Machining of back and bottom to be absolutely accurate; (2) spacing and drilling of screw holes coincide precisely with tapped holes in bed and flyer; (3) uniform blade temper end-to-end of each knife; (4) all knives relatively malleable to avoid need of special or individual adjustments during installation or while in service.

knives will be less than perfect. Seasoned operators realize this. Adjustments for correcting initial imperfect cutting must be conducted in easy stages with ample honing between stages. Before making any knife adjustments, the operator should determine whether variations of basis weights and moisture are contributing to defective cutting.

An important factor to consider in knife adjustments is the expansion of metal, which occurs as the knives "warm up" during normal operations. Although metal expansion alone is responsible for more knife changes than all other failures combined, this significant factor is frequently overlooked by operators. If an operator is pressed into making major adjustments to obtain perfect cutting from cold knives, he will ruin the knives. As the metal masses expand, the fly-knife will begin to strike the bed-knife too heavily. This causes crystallization, which results in nicking and crumbling of the edges within a few hours. In nearly all instances, crowding of new knives can be eliminated by job planning. Most finishing rooms can arrange beforehand to cut rejects or secondary pulp grades that do not require perfect cutting during knife "warm-ups."

For High-Value Maintenance

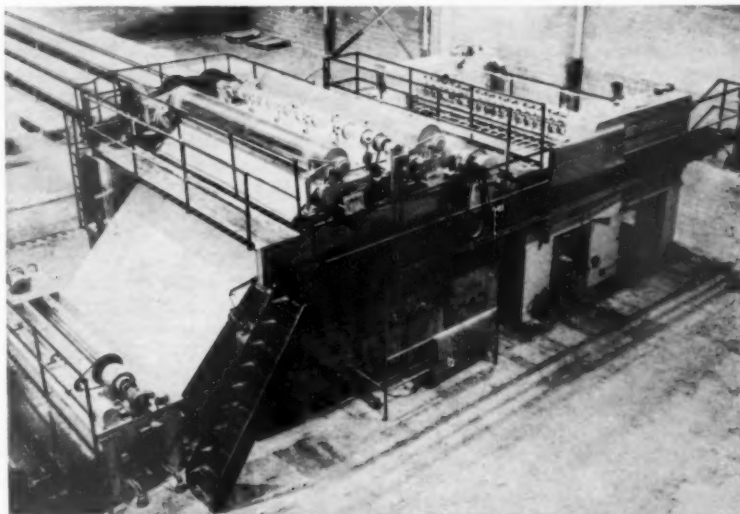
Job training and delegation of responsibility are primary factors concerning knife service. A big obstacle is the presence of untrained personnel who persist in making knife adjustments at the slightest indication of imperfect cuts. The key to corrective measures is a common-sense analysis of why the sheet is not being cut properly. Some questions to be resolved: Has there been a significant change in basis weight, moisture content or caliper? Has the doctor blade shifted?

Is there slippage in the knife drive? Are the speeds of the draw rolls and the layboy belts properly synchronized? Are the supporting jacks under the bed anvil in accurate adjustment? Has there been radical change in knife speed?

After checking these, the operator should take a long careful look at the cut and decide whether it is acceptable—even though imperfect—or whether it is so ragged as to require immediate improvement. If he determines that the knives are at fault, he must also consider the location of defective cutting before making an adjustment. Most discrepancies occurring near the center of the sheet can be corrected by merely raising the jacks supporting the bed-knife. If the defect is localized near either end,

the solution is simple—pull up the bed-knife at the end indicated, hone the full length of each knife, allow the flyer to make several revolutions, then re-hone. The operator is wise not to try to correct a knife problem by one severe adjustment. He should, instead, depend on a series of very slight adjustments interspersed with sufficient honing and wear-in time. Whatever is done, "easy does it."

The bed-knife should not be shifted more than a few thousandths of an inch each time. The use of the individual set screws distributed along the back of the fly-knife should be avoided. These set screws have only one function. They are intended to aid in combatting slight irregularities in grinding that may become noticeable during the installation of newly-



MODERN FINISHING ROOM STAFFED by skilled personnel is route to significant production economies.

... Quality, Low-Cost Pulp Cutting

sharpened knives.

Once the new knives have been brought into alignment and are meshing evenly from end to end, nothing should be done to disrupt this straight-line shear. If grinding discrepancies compel many adjustments of the individual set screws, the knives are destined for disappointingly short life. Experience has shown that knives that have lost the solid backing of the knife channel and are supported only against the points of the set screws vibrate upon impact, thus causing the edges to crumble and disintegrate within a relatively short period. Should it become necessary to manipulate the same set screws on successive changes, a defect in the knife channel is indicated. This condition can be overcome by precisely fitting shim stock behind the back of the knife.

Honing Pays Big Dividends

One of the repetitious rituals of daily knife maintenance is proper and timely honing. This simple procedure, coupled with annealing, makes possible such tremendous yields as 120,000 tons of cutting per knife grind. Normal shearing action of the fly-knife tends to create a slight burr on the surface of each knife. This burr is objectionable for several reasons. First, it retards the smooth flow of the sheet over the bed-knife; ensuing jumping and hang-up of the bottom sheet result in non-uniform sheet lengths, coupled with poor stacking. Second, if the burr is allowed to build up, it will eventually crumble away, leaving minute knicks that will continue to increase in size until the resultant cut becomes abortive enough to demand a knife change. Burr formation can be readily eliminated by honing the surface with a medium grit carborundum stone. It is preferable that this be done once a shift, though not less than once every 24 hours. When conducted at regular intervals, each honing operation requires less than 5 min. daily.

Despite the fact that the operator may have complied with all normal precautions of knife settings and daily maintenance, there will be times when he finds himself frustrated by the appearance of crumbling along a knife's cutting edge. This crumbling is actually the accumulation of many minute knicks that, when once allowed to occur, cannot be remedied short of a complete knife change. The inexperienced operator may attribute this failure to be of a mysterious origin and shrug it off as the result of plain bad luck. Nothing could be further

from the truth. The failure has a cause.

Anneal For Long Blade Life

Too few operators consider the fact that knives clash together at rates of up to 10,000 times per hour—approximating 1,000,000 contacts for each five days of operation. Even the best of cutting steel will eventually lose its malleability when subjected to this prolonged pound. Under high-speed operating conditions, where knife speeds exceed 150 rpm, records indicate normal life expectancy of knives to be about 50,000,000 revolutions. A heavy, slow-moving installation can of course expect to double this service period. These figures refer only to knives that have been properly annealed after each grinding.

It is not unusual for operators to be perplexed by the fact that the same pair of knives may last four months during one operational period but only four days on a successive run. The answer is relatively simple—the knives have been resharpened and reinstalled without having been treated to eliminate the crystallization resulting from four months of pounding. No effort has been made to recover the malleability of the cutting edges. It's no wonder that "hard spots" developed during the original operation period. They should be eliminated. Otherwise, continued use results in continued crumbling, a prime cause of rapid failure. In order to be convinced that "hard spots" do exist and contribute to knife failures, one need only run a sclerometer test on the dulled knives. In all cases the high readings will coincide with the areas showing signs of knicking or crumbling.

Designing an annealing chamber is an easy chore, although a few basic rules are mandatory for its use. Knives should always be annealed after grinding and in pairs as intended for use. Instrumentation is needed for time-temperature control. Processing is to regain original malleability of the cutting edge, not to distort the temper of the entire knife. Operators who would rather not experiment with homemade annealing devices can obtain this equipment custom-built to their own particular needs.

Training in cutting techniques has reduced the frequency of knife changes at specific mills from an original average of 12 to two changes per year. This can mean an average yield of 75,000 tons of cutting from each knife grinding and occasional cuts of above 110,000 tons.

Average savings of \$2,500 per knife change are achieved through applica-

tion of skillful cutting techniques and practices. This is a conservative estimate founded on personal in-mill studies. Factors included in the savings figure: (1) Value of wastes resulting from avoidable changes cutting steel, labor; (2) minimum loss of productive time; (3) eliminating product degrade resulting from imperfect cutting. On this basis the potential savings to each pulp mill from job training alone would be about \$25,000 per year.

Readers are invited to estimate the total cost of defective cutting throughout the industry in one year. One guess is upwards of \$15,000,000.

This article is entirely too brief to embrace all the complexities of pulp cutting, and for this reason discussions of such contiguous items as doctor blades, angle of sheet feed, shear of the knives, constant load knife drives, synchronization of draw rolls, necessities of uniform friction, etc. are avoided. These remaining phases of the operation will be covered in future articles. In the meantime it is suggested that you apply modern methods to overcome deficient cutting. Look around! It's good business to take advantage of what progress has to offer.

Many of the techniques employed by ultra-modern installations are directly applicable to your own needs. For instance, the brightest spot on the pulp finishing horizon is the advent of a newly-designed heavy-duty pulp cutter recently installed in Alaska Lumber & Pulp Co. Inc.'s mill at Sitka, Alaska. Here is a combination of a sufficiently heavy, perfectly-balanced knife cylinder powered by a well engineered drive. This unit has a capacity of 60 tons pulp per hour and maintains a uniform sheet length. Among other advantages, it has a unique highly-adjustable bed-knife doctor blade, and the fly-knife blade is mounted to a heavy knife-bar, which permits knife adjustments in specified areas while continuing to provide ample support to the back of the knife. As far as has been determined, the Sitka machine is the first heavy-duty knife cylinder that employs the knife-bar system of securing the blade. This greatly simplifies knife maintenance and will result in improved knife life.

If you still employ the old methods of cutting, bear in mind that the only things that were better in Grandpa's day were hunting, fishing and taxes—not pulp cutting. He never dreamed of 110,000 tons of high-speed cutting from one knife grinding.

How Big is Pulp and Paper?

A prominent forestry economist points up the many methods for measuring industry size. All have merits, depend on point of view.

By **GEORGE R. ARMSTRONG**
New York State University
College of Forestry

• Comparative size of the pulp and paper industry and its importance in the national economy are matters of great interest when considering prospects for growth and development. Both present status of the industry and its past trends are vital data. They can serve as the jumping-off point for discussions about inter-industry competition and opportunities for the future. Statistics on industrial size, however, become outdated and are often misunderstood or misused and thereafter misquoted. This is especially true for the pulp and paper industry, which for too long has been vaguely labeled as "fifth largest" or "second fastest growing."

Defining The Industry

There are many who think in terms

of paper and board mills when they talk about the industry. Others include the pulp mills. Still others add converters. Sometimes even the printers and publishers are thrown in for good measure.

The Bureau of the Census recognizes pulp mills, paper and paperboard mills and building paper and board mills as three separate industries because each produces a distinct and more-or-less closely related group of products. Taken together, these three industries constitute a minor industry group of recognizable homogeneity. And when they are combined with the paper converters, which include nine other industries (See Fig. 1), a major industry group is formed that the Bureau calls "pulp, paper and allied products." Printers and publishers are considered as another major group.

In this first assessment of industrial size it will be helpful to confine discussion to the major group—pulp, paper and allied products. Statistics become especially meaningful if sev-



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eral years are considered; in this instance, the years 1950-58, inclusive.

Selecting Measures of Size

How big is an industry. There is no one descriptive measure. We think in terms of how much labor or raw material or capital is needed to do the job. Or, alternatively, we think in terms of the quantities or values of output or product. Any single measure has its utilities. On the other hand, it is probably not without its drawbacks.

Value of production (shipments), for example, is a poor measure to use in comparing major industry groups because it often involves double counting. Thus the value of pulp would be included not only in pulp mill shipments but also in the value ascribed to paper mill shipments.

Seven Useful Measures

There are several criteria especially helpful in analysis of the size of major industry groups. First among these is *value added by manufacture*. In fact, value added is generally acknowledged the best single measure for comparing the size of the various manufacturing industries. It is equivalent to value of shipments less cost of inputs, which represent work of other firms—materials, supplies, containers, fuel, electrical energy and contract work. Consequently, value added avoids the double counting difficulty. It is, es-

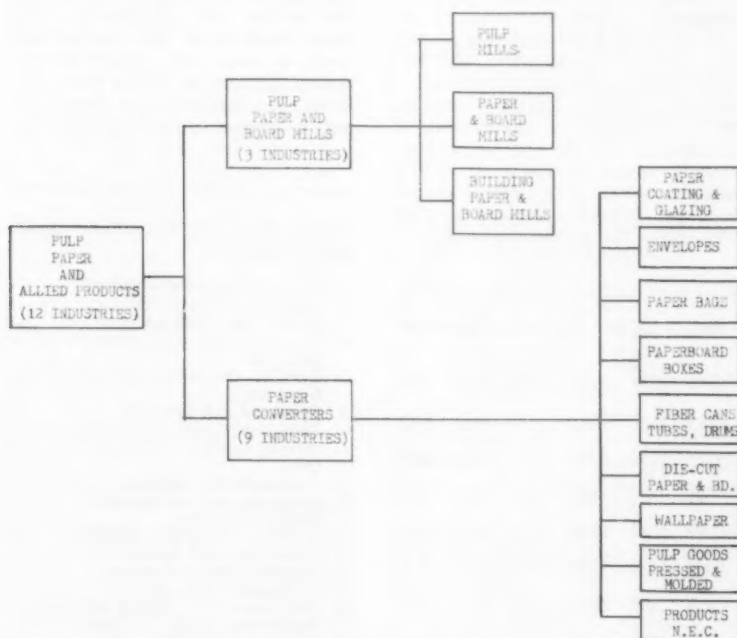


FIGURE 1—Industry Classification

... How Big is Pulp and Paper

entially, that part of the Gross National Product produced by the manufacturing industry or firm and comes closest to expressing the full value of the contribution made by bringing together raw materials, labor and capital in a particular combination.

Another measure of industrial size is *national income generated*. This criterion represents the total income of labor and capital derived from current production. For the manufacturing industries it is generally 20 to 30% less than value added by manufacture, because it excludes costs due to maintenance of plant and amortization of capital, indirect business taxes, services incurred and the like. One good feature is that, unlike value added by manufacture, it applies not just to manufacturing industries, but to all industries and therefore can be used to show the contribution of the pulp, paper and allied trades in the whole economy.

A third measure of industrial size is *corporate income before taxes*. This, of course, represents the major share of the industrial income derived from current production. Ideally, incomes from unincorporated enterprise should be considered too, but these data are not readily available.

A fourth measure is *total corporate assets*. This tells us how much capital is tied up in a particular form of enterprise. Total assets usually include cash, negotiable securities, accounts receivable, inventories, prepaid expenses and, importantly, plant and equipment.

A fifth criterion is *current total expenditures for new plants and equipment*. This, of course, is related to the previous measure, since it represents annual conversion of assets from one form to another. It is included be-

cause it helps to separate "plant" from other assets and serves as an indicator of expansion and growth.

The sixth and seventh items on the list take account of the role of labor in the industry. They include *number of full-time equivalent employees* and *average annual earnings per employee*.

It is not hard to think of several other measures. Number of firms is one, size of corporate dividend payments is another. But, for the present, the discussion is confined to the seven measures listed above.

Using the Measures

Table I shows for pulp, paper and allied trades as a group what values were for each of the seven measures of industrial size in the years 1950 through 1958. Next step is to find out what share they represent of the totals for all U.S. industry and for all manufacturing industry; and how they compare, in various respects, with the 18* other major groups of manufacturing industries recognized by the Bureau of the Census and shown in Table II.

There are really 19 others. The last, miscellaneous manufacturers, is not considered here.

Role of Pulp, Paper and Products

If national income generated by the pulp, paper and allied trades is compared to that generated by all U.S. industry, it is found that for the nine years 1950 through 1958 the pulp, paper and allied trades contributed consistently a little more than 1%. Furthermore, in making such a contribution, the industry group consistently employed about 1% of the nation's workers at an average annual wage per full-time employee ranging 3-5% above the national average.

When measured in various ways, percentage of all manufacturing activity by the pulp, paper and allied trades remained almost constant. These manufacturers consistently represented from 3-5% all value added, all national income generated, total corporate assets, all corporate income, all employment and all current expenditures for new plant or equipment by U.S. manufacturers (See Table III).

Many industry groups boasted larger percentages in those same years. Table IV shows how the pulp, paper and allied trades ranked among the other 18 industry groups in terms of the several measures of size.

One thing is immediately clear. In any given year the industry group can be said to have one of several rankings. In 1956, for example, it would be quite proper to say that the industry group was 6th, 9th, 10th, 11th or 12th largest, depending on the measure used.

Of course, it was noted earlier that the one most meaningful measure of size is value added by manufacture. In terms of that particular criterion, pulp, paper and allied trades ranked as 11th largest major manufacturing industry group in the United States from 1950 through 1957 and 10th largest in 1958.

If there is a lesson to be learned from this brief examination of industrial magnitudes, it is that a helpful comparison of industrial sizes includes at least four elements: a time, definition of the industry, specific mention of the size criterion used and some mention of the number and kinds of units with which the particular industry is being compared. It is not enough to say that, "The pulp and paper industry is 10th larg-

TABLE I—Values of Selected Measures of Industrial Size For Pulp, Paper and Allied Trades 1950-1958

Measure of Comparison	1950	1951	1952	1953	1954	1955	1956	1957	1958
Value added by manufacture (million \$)	3438	4180	3883	4463	4581	5082	5509	5642	5855
National income generated (million \$)	2683	3373	3120	3317	3351	3725	4186	4043	4000
No. of full time equivalent employees (thousands)	484	510	503	531	532	550	567	565	555
Avg. annual earnings per employee (\$)	3479	3763	3974	4169	4289	4524	4764	4963	5142
Total corporate assets (million \$)	5277	6278	6395	6669	7184	8129	8923	N.A.	N.A.
Corporate income before taxes (million \$)	989	1331	938	928	890	1095	1272	N.A.	N.A.
Current total expend. for plants & equip. (million \$)	327	420	364	409	455	518	801	811	578

N.A. = Not Available

TABLE II—Major Manufacturing Industry Groups

1. Food and kindred products
2. Tobacco manufactures
3. Textile mill products
4. Apparel and other finished fabric products
5. Lumber and wood products, except furniture
6. Furniture and fixtures
7. Pulp, paper and allied products
8. Printing, publishing and allied industries
9. Chemicals and allied products
10. Petroleum and coal products
11. Rubber products
12. Leather and leather products
13. Stone, clay and glass products
14. Primary metal industries
15. Fabricated metal products
16. Instruments and related products
17. Machinery, except electrical
18. Electrical machinery
19. Transportation equipment

est." A meaningful alternative would be, "The pulp, paper and allied trades were 10th largest of the 18 major industry groups in 1958 in terms of value added by manufacture."

Significance of Rank

What implications are there in the fact that, in terms of value added, pulp, paper and allied trades was the 10th largest U.S. manufacturing industry group in 1958? In a field of 19 such groups, that was just about average. It is easy to assume that such a standing was not as good as being 4th or 5th largest, and that some other industry groups were better because they were making more contribution to the economy. But to think this way without qualification is a mistake.

For one thing, industry ranking is to a large extent determined in advance by the method of defining industry groups. If printing and publishing were to be included in the pulp, paper and allied trades, rankings would be affected materially. Obviously, too, an industry group like primary metals is much more likely to use larger amounts of labor and capital in manufacture than tobacco products. For the same reason, chances are good that it will add annually more value through manufacture. Tobacco manufacturers, limited by the nature of the homogeneous group of products produced, could never hope or aim to be first in value added in an economy structured like ours; although they might aspire to the 18th instead of the 19th place, which they hold currently.

There are still other reasons for not considering rankings as direct measures of economic health. Consider industrial size based on total employment. Is one ranking "better" than another? Some industries, like the petroleum industry, with its big cracking plants and refineries, characteristically depend heavily on capital and to a very limited extent on labor. In 1957, assets of the petroleum and coal industries totalled almost \$120,000 per production worker.

At the other extreme, were the producers of wearing apparel. Their assets amounted to less than \$4,000 per worker, and such ratio was typical of the type of enterprise.

The pulp, paper and allied trades, with corporate assets of about \$17,000 per worker in 1957, lay between these two extremes. Interestingly, investment in this industry was far above the average. Only three industry groups besides petroleum and coal had more capital invested per worker than did pulp, paper and allied products. These three were to-

TABLE III—Measures of Activity Pulp, Paper and Allied Trades Expressed as a Per Cent of all Manufacturing Industry Activity

Measure of Comparison	1950	1951	1952	1953	1954	1955	1956	1957	1958
Value added by manufacture	3.83	4.09	3.56	3.67	3.92	3.86	3.94	3.90	4.12
National income generated	3.61	3.81	3.46	3.39	3.68	3.56	3.83	3.59	3.86
No. of full time equivalent employees	3.23	3.15	3.06	3.08	3.31	3.31	3.35	3.35	3.57
Avg. annual earnings per employee*	105	104	104	103	104	104	104	104	104
Total corporate assets	3.73	3.90	3.76	3.77	3.95	4.04	4.12	N.A.	N.A.
Corporate income before taxes	4.20	5.41	4.63	4.29	4.74	4.16	5.05	N.A.	N.A.
Current total expenditures for new plants and equipment	4.37	3.87	3.13	3.43	4.12	4.53	5.36	5.08	5.06

*Percent of the National Average for all Manufacturing

N.A. = Not Available

TABLE IV—Ranking of Pulp, Paper and Allied Products In Terms of Selected Measures of Size Among 19 Major Groups of Manufacturing Industries

Measure of Comparison	1950	1951	1952	1953	1954	1955	1956	1957	1958
Value added by manufacture	11	11	11	11	11	11	11	11	10
National income generated	13	12	12	12	12	13	12	12	10
No. of full time equivalent employees	13	13	13	13	12	13	12	12	12
Avg. annual earnings per employee	11	11	11	11	11	11	11	11	12
Total corporate assets	10	10	10	10	10	10	10	N.A.	N.A.
Corporate income before taxes	10	9	9	9	9	10	9	N.A.	N.A.
Current expenditure for plants and equipment	8	8	9	8	7	7	6	7	7

N.A. = Not Available

bacco manufacturers, producers of chemicals and allied products and producers of primary metals.

The point is that each industry group tends to use labor and capital in different proportions depending on the nature of raw materials used, types and abilities of labor force, degree of development of production technology, assessment of market potential for products in the long and

short run, etc.

This all adds up to one thing. Measures of size are of more importance in characterizing industries than in rating them. Only when the factors underlying rankings have been explored do the real bases for discussing industrial potentials emerge. And such explorations, especially when growth rates are considered, can be highly remunerative.

"Expanding Horizons" Theme of 60th SAF Convention

Future developments in forestry will be the theme as the Society of American Foresters gathers for its 60th annual national meeting at the Sheraton-Park Hotel, Washington, D. C., November 13-16.

More than 1,000 foresters from the United States and Canada will be in attendance to hear some 70 papers on subjects ranging from forest tree genetics to wood technology.

Keynoting the convention will be Richard E. McArdle, chief of the U. S. Forest Service; William C. Bramble, head of the Dept. of Forestry & Conservation, Purdue Univ., and William M. Bailey of International Paper Co., who will analyze the scientific achievements of professional forestry with

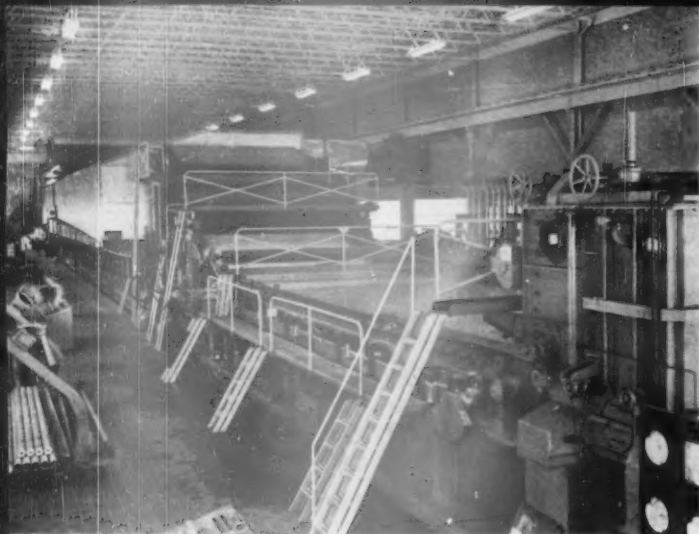
special reference to industrial forest management.

SAF's 1960 meeting follows closely on the heels of the Fifth World Forestry Congress, scheduled for Seattle in August and September.

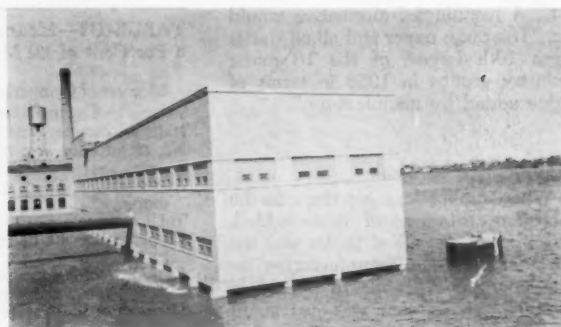
Paper Mill Men Will Kick Up Their Heels

The 25th annual Hi-Jinks staged by the Paper Mill Men's Club of Southern California will be held October 7 at the Fox Hills Country Club in Los Angeles. For the first time, a gin rummy tournament will be part of the program.

Indoor and outdoor sports will be "the order of the day." The day will conclude with the yearly banquet plus entertainment.



WET END of spanking new No. 3 machine at Nicolet Paper where new hood and ventilating design may blaze new trail in air supply systems.



WATER: PLENTIFUL AND NEARBY . . . at new No. 3 machine room addition recently completed by Nicolet. Valley machine has speed range of from 300 to 1,200 fpm.

Smooth Start for Nicolet's No. 3

Glassine, greaseproof grades produced—among others—at output rates from 20-35 daily tons (glassines) to 110 tons (bleached kraft)

By **DON W. ZEIGLER**
Midwest Editor

—West DePere, Wis.

● Twenty-six tons per day since start-up has been the record of the Valley Iron Works Corp. machine that recently went into operation at Nicolet Paper Corp.

The 160-in. No. 3—a right-hand unit—is designed for glassine and greaseproof grades. Producing salable paper within three hours after start-up, the machine marks Valley's entry into the complete paper machine field.

Various grades (greaseproof, glassine, supercalendered sulfite, bleached kraft envelope, calender paper) will be produced in a speed range from 300 to 1,200 fpm at a production rate ranging from 20-35 daily tons on quality glassines and up to 110 tons on bleached kraft.

Major components of No. 3 include an air-loaded headbox, cantilevered Fourdrinier, four-unit press section, main dryer section, size press, after dryer section, calender, reel and winder.

Wire Change Simplified

The headbox receives stock from Vorvac cleaners and two Selectifier screens. Accepted stock flows into a dual tapered stainless steel manifold with eight entry ports leading into the first of the three passes in the head-

box, which was designed with two stainless steel distributing rolls. An air motor-operated adjustable baffle controls velocity of stock flow into the inlet pond. A fully-adjustable inlet (or slice) is attached to the headbox.

The wire of the cantilevered Fourdrinier measures 160 in. wide and 96 ft. long. A centrifugally-cast bronze breast roll is mounted on the upstream cantilevered beam and is raised and lowered for wire changes through an air motor and reducer.

Vacuum of the oscillating stainless steel suction boxes is controlled through a Broughton system. The 36-in. dia. suction couch is attached to the third cantilevered beam, eliminating necessity for dismantling suction connection during wire change.

"Unique Rig" Installed

Incorporated into the design of the Fourdrinier section is a "unique" wire-changing rig. The wire bundles and poles are placed in the couch carriage, which includes an under-carriage. The breast roll carriage is placed in position, and the wire loop is secured by poles in this carriage. The couch carriage (together with the under-carriage, moving in tracks along the tending side aisle) is drawn manually toward the couch and turning roll. After the wire has been paid out and all wire poles placed in position, the wire-stringing device is

pulled into the Fourdrinier, the couch carriage rolling on the tracks provided with the under-carriage arrangement. This design avoids tying up the crane during wire changes.

A Teflon-coated driven blow roll guides the sheet from the bare wire between the couch and turning roll to the felt roll of the first press. Press section consists of a suction first press of conventional design; a second press that operates as an air bleed unit; a plain, inclined reverse press in the third position, followed by a plasticizer press. The latter is designed with a special knurled kissing roll.

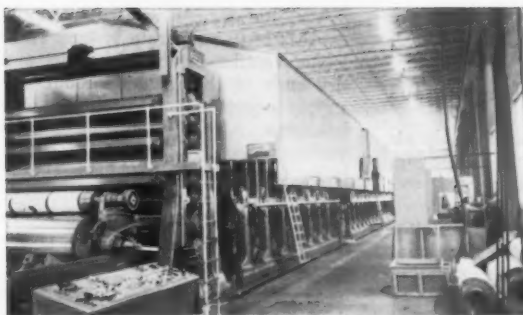
Seam-Straightner Featured

Automatic recycling felt tension devices have been incorporated in the felt stretchers. These also include an air-operated seam-straightener. Felt runs in each of the first three presses include automatic air guides, hand guides and Bird felt conditioners.

Dryer area consists of main and after dryer sections. Main dryers are split into two sections, with an automatic rope transfer. The first section of fourteen 48-in. dia., 160-in. face paper dryers also includes two felt and four Feeney dryers. Second section has 14 paper dryers, two felts and two Feeneys. The after dryer section has 14 paper dryers, two felt dryers.

Inspection windows are provided at

Continued on page 104.



TAPERED DUCT along bottom of hood is air curtain duct, part of new design in machine hood and ventilation system. In foreground is calendar, in center the after dryer hood and in background the main hood.



BACK SIDE AT DRY END of the new machine at Nicolet Paper Corp. shows machine hoods, exhaust ducts and axial fans (at left). Guards in the foreground enclose drive mechanism.

Featuring New Hood Design

Said to be first of its kind in the paper industry, hood and ventilation system boasts many departures from traditional ideas

By **J. F. ECKELAERT**
Engineer, Overly's Inc.

● Outstanding feature of the new machine installation at Nicolet Paper (see opposite) is the new hood and ventilating system design one of the first of its kind in the industry.

Manufactured by Overly's at Nee-nah, Wis., the hood pioneers use of Alcoa Alply aluminum panels for the roof and sides.

The entire ventilating and drying system is composed of (1) Air Curtain hood; (2) machine hood exhaust system; (3) Air Curtain supply system; (4) basement enclosure supply; (5) pocket ventilation system; (6) wet and dry end supply systems; (7) wet and dry end roof exhausts.

Aluminum Highly Functional

The aluminum hood rests on the machine frame by means of a structural aluminum frame. (Structurally, the hood consists of 3-in. styrofoam fireproof insulation sandwiched between aluminum panels.)

The hood's design strength and high resistance to thermal conductivity are highly functional. Also, the panels may be easily removed and reassembled for maintenance purposes. The hood has a distributing exhaust baffle incorporated into its structure, forming a continuous plenum along its

entire length and insuring a uniform exhaust pattern. Air is drawn from the top-center into the exhaust plenum and out the exhaust ducts.

Machine hood exhaust is accomplished by three large vaneaxial fans pushing air from the main hood and one smaller vaneaxial fan on the after dryer hood. Moisture-laden air is drawn off the top on the drive side and exhausted out the rear of the building. Air volume is controlled by a manual pneumatic switch that operates volume dampers within the exhaust ducts.

Three-Fold Purpose

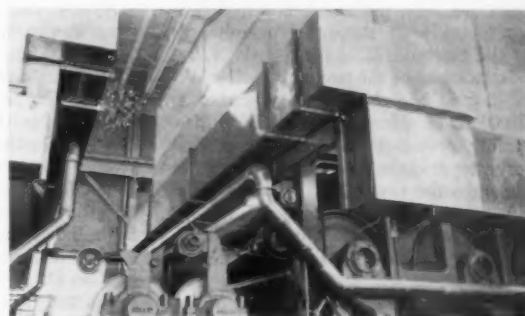
Air Curtain supply air equipment is located in the basement and consists of dampering, filtering, pre-heat and

re-heat coil section and a fan that supplies tempered fresh air to the duct system. Aluminum ducts located on both sides of the hood along its entire length are tapered for even distribution and are provided with an outlet slot at the bottom, through which tempered air is discharged—forming a curtain of air.

This air curtain forms a partition with a three-fold purpose: (1) to obtain more efficient drying; (2) to partition the working area from machine temperatures, and (3) to provide accessibility. The system essentially provides the access and appearance of a semi-enclosed hood, yet performs with the efficiency of a totally-enclosed arrangement.

Continued on page 104.

DUCT WORK BETWEEN HOODS (from tending side). Rectangular aluminum ducts are for the air curtain, while circular aluminum duct immediately below is the pocket ventilating, or Grewin, duct system.



... Nicolet's No. 3 Machine

SMOOTH START .. from page 102

the nips of the gears, also on the tending side bearing housings. All dryers are equipped with the latest quick-release Johnson steam joints and rotating syphons. Oscillating Lodding doctors are used in all dryer sections.

No Size Tub Needed

The horizontal size press follows the second section of the main dryers and is designed with two 28-in. dia. rubber-covered press rolls. The sheet passes over a brass lead-in roll into the nip of the size press, where size is supplied to either one or both sides of the sheet through stainless steel headers and equally-spaced discharge nozzles. This design makes it possible to operate without a size tub and permits greater control of sizing penetration on either side of the sheet. A simple interlock shuts off flow of size when the press is unloaded and the rolls still in contact.

After Dryer Section

Sheet leaves the after dryer section under a pneumatic rubber tire-mounted spring roll into the Farrel-Birmingham calender stack designed for nip pressures of up to 600 pli.

Calender is followed by a Valley horizontal track reel arranged for both surface and center wind operation. The reel is equipped with a 36-in. dia., 160-in. face cast iron drum and can build mill rolls up to 55 in. in dia.

Six instrument consoles located on the tending side of the machine control the various components, beginning at the headbox and extending to the winder.

NEW HOOD DESIGN from page 103

The basement enclosure supply air equipment consists of a dampering, filtering, pre-heat and re-heat coil section and a fan supplying tempered fresh air to the enclosure. The latter is fabricated of corrugated aluminum siding on angle iron frames extending from floor to beam. Doors are of course provided for maintenance, and a large access door is located at the dry end for broke removal. Air supplied to the basement enclosure is drawn up through the paper machine absorbs moisture and is exhausted.

Purpose of the pocket ventilating system is to supply heated air through special nozzles at high velocity to each pocket formed by the dryer rolls and felt run. Nozzles are located alternately on front and rear sides of the machine to evacuate and absorb generated moisture. The nozzles, regulated by butterfly valves, are supplied by a duct system fabricated of welded aluminum pipe. Air is drawn from the basement, filtered, heated by pre-heat and re-heat coils and discharged to the duct work by a pressure blower.

Among Suppliers to Nicolet Project . . .

Vacuum Control, Showers: A. E. Broughton & Co.
Automatic Air Guides, Air Guide Roll: Gilbert & Nash div., Appleton Machine.
Doctors: Lodding Engineering Corp.
Rubber Covering: Stowe-Woodward Inc.
Suction Press, Couch Rolls: Beloit Iron Works.
Felt Conditioners: Bird Machine Co.
Steam Joints: Johnson Corp.
Lubrication System: Bowser Inc.

Wet and dry end ventilation supply consists of two separate systems furnishing ventilation air to the wet and dry ends of the machine room. Air supply equipment is located in the basement. Air is discharged to the various sections of the main floor by a large fan through basement supply ducts. Double-deflection discharge grilles with volume dampers are located on the main floor—14 grilles on the dry end 17 on the wet end.

At all points where ducts pass through the machine floor fire dampers were installed. System balance is obtained with volume dampers and proportioning dampers located in the duct system.

Temperature is controlled by a pneumatic control system in conjunction with modulating steam valves, face and by-pass dampers and an override protection system that keeps the pre-heat coil open for steam whenever entering air temperature is below a pre-set temperature. Outside air dampers also close automatically when fans are not operating.

Wet and dry end roof exhaust is obtained by four roof ventilators—two located on the dry end and two on the wet end.

Cram Dryer Drainage: Appleton Machine Co.
Fixed Expander Roll: Mount Hope Machinery Co.
Clutches: Fawick Airflex div., Federal Fawick Corp.
Winder: Cameron Machine Co.
650-hp Steam Turbine: DeLaval Steam Turbine Co.
Gear Reducers: Falk Corp.
DC Generators: Westinghouse Electric Corp.

\$17 Billion Industry Plans Forum

More than 1,500 packaging professionals are expected to attend the 22nd annual National Packaging Forum sponsored by the Packaging Institute. The gathering is scheduled for October 31 through November 2 at the Statler-Hilton, New York, N. Y.

Chairman of the program is Roy W. Abing of Merck Sharp & Dohme, a division of Merck & Co. Inc. Mr. Abing promises "to open one of the largest packages in history" when he unwraps the predictions of more than 50 nationally-recognized packaging experts who will present papers and forecasts during the three-day meeting.

The chairman reminds all who are

interested in this \$17 billion industry that, "implications gleaned from present applications chart the course of packaging's future."

Among the participants: Frank W. Cray, vice pres., Printing Ink div., Interchemical Corp.; Thomas E. Cathcart Jr., sales mgr. (folding cartons), Boxboard & Folding Cartons div., Continental Can Co. Inc.; Paul B. Reuman, research supervisor, Continental Baking Co.; H. G. Walter, exec. director, Packaging Foundation Inc., Michigan State Univ.; Peter B. Baker, senior staff member, Arthur D. Little Inc.; Ralph F. Hansen, asst. to the director of marketing, Monsanto Chemical Co.; Dr. L. E. Simerl, director of research and development, Film div., Olin

Mathieson Chemical Corp.; Charles O. Roth Jr., regional product development engineer, West Virginia Pulp & Paper Co.; Allyn C. Beardsell, director, New Products div., the Mead Corp.

W. O. Bracken, plastic sales development, Hercules Powder Co.; R. C. Berger, Equipment Industries Engineering section, Apparatus Sales div., General Electric Co.; William J. Rothfuss, gen. mgr., equipment, Cryovac div., W. R. Grace & Co.; Ira Gottscho, president, Adolph Gottscho Inc.; Roger L. Putnam Sr., board chairman, Packaging Machinery Co.; Robert Kelsey, engineering editor, *Modern Packaging*; Ernest A. Green, vice pres., Printing Ink div., Interchemical Corp.; Robert Zuckerman, mgr., New York sales office, Kidder Press Co. Inc.

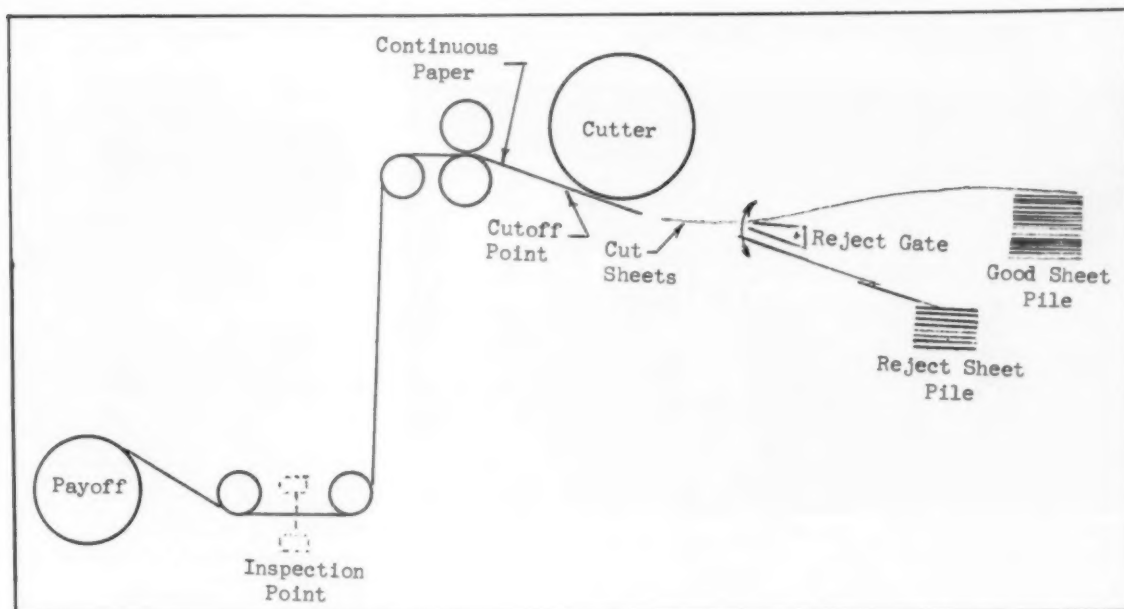


FIGURE 1: Modern sheet-sorter automatically inspects, classifies and piles sheets cut from a continuous roll into good and rejected sheet piles.

Automatic Sheet Sorting

High speed, accurate sorting is here with classifier which inspects and sorts sheets at 800 fpm and makes 200 cuts/min.

By M. L. MATTHEWS
Maxon Automatic Machinery Co.
Westerly, R. I. and
EDWARD MOJKOWSKI
Westinghouse Electric Corp.
Boston, Mass.

● A sheet classifier which automatically sheets-sorts with a minimum need for human attention has been developed. Photo-electric devices detect paper flaws in the continuous sheet from the paper reel. The sheeteer cuts the paper into accurate sheet lengths. An automatic classifier sorts sheets into good and defective piles in response to paper defect signals. Stackers accurately pile the sheets, eliminating guillotine trimming in most cases. Human attention is limited to a simple set-up of the machine for sheet length and production speed and the normal handling of paper to

and from the machine. Figure 1 shows the flow diagram for the paper through the sheeteer-sorter.

In production the automatic sheet classifier automatically inspects and sorts paper sheets at production speeds of 800 fpm and 200 cuts/minute. Automatic inspection results in highly reliable consistent detection of paper flaws such as pin holes and blemishes.

Present Classifier Methods

There are five methods for classifying sheets. The typical machine in most methods is shown in Figure 2. The difference in classifying methods is basically in the type and location of the sheet classifying device. Oldest of these schemes is the one in which a human sorter visually scans the paper sheets as they leave the cutter and are piled at the layboy. The operation is limited to the maximum speed at which the operator can re-

liably scan the paper sheets. This is usually about 200-250 feet per minute (fpm) maximum. Some finishing rooms prefer to utilize the cutter-layboy at its peak production capability of upwards to 1000 fpm with no regard to sorting. Rather, several persons in a separate sorting room classify the individual sheets. Although the cutter layboy is operated at maximum production rates the cost per finished sheet is not materially reduced. First steps in the automation of sheet classifying involved the location of a human sorter between the cutter and the reject gate. The sorter visually scans the sheets as they leave the cutter. When a defective sheet passes the sorter at rates of up to 300 fpm, he presses a pushbutton to operate a reject gate and cause the defective sheet to be rejected. Further refinement in the art of classifying relocated the operator (sorter) from the exit to the entry end of the ma-

Automatic Sheet Sorting

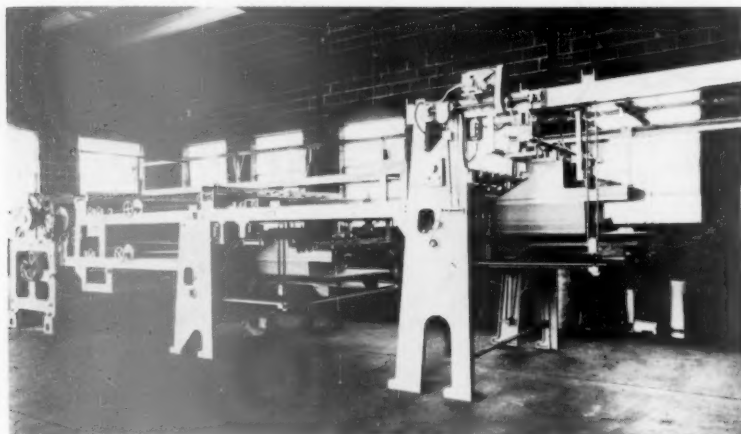


FIGURE 2: Good sheets are guided along tapes at top and rejected sheets guided at bottom to pilers at right.

chine. This enables the operator to scan the continuous sheet as it passes a reference line prior to entry in the cutter. Thus, in effect the operator need scan only a line rather than a whole sheet in looking for flaws. Since the operator scans the continuous sheet whereas a specific faulty sheet must be rejected, some means of identifying this sheet and causing its rejection at the reject gate must be included in the control scheme. Automatic classification accomplishes this function.

The Automatic Classifier

The automatic sheet classifier transfers fault signals, initiated by the operator's pushbutton, in synchronism with the passage of an equivalent sheet from the inspection point to the reject position. One means of providing this transfer of data is by a mechanical memory device. The memory device, adjusted for sheet length and paper speed, delays the operation of the reject gate beyond the cutter until the sheet containing the defect has reached the reject position. The memory device is basically mechanical and is limited to a paper speed of approximately 200-350 fpm. The accuracy of the scheme is limited to about 2 inches of the edge of the sheet in distinguishing which sheet to reject.

A fully automated sheet classifier method has been developed within the past year which inspects, classifies and stacks paper sheets without assistance from human hands. Operators are required only for handling paper rolls to, and stacked sheets from

the machine. The automated method permits use of the sheeter-sorter at maximum production rates of up to 1000 fpm while automatically inspecting, classifying and stacking sheets.

The automated sheeter-sorter (Figure 2) draws paper from the payoff reel through pinch rolls and feeds it to the rotary cutter. The cutter is connected to the main machine drive through variable pitch pulleys. As one revolution of the cutter represents one length of sheet, the relative speed of the machine and the cutter determines the length of cut paper sheet. Shortly beyond the cutoff point (about 26 inches) a reject gate segregates good and defective sheets. The good sheets are directed by a set of driven tapes along the upper level of the layboy to a sheet stacker at the extreme right of the machine. The defective sheets are directed by another set of driven tapes along the lower level of the machine and re-deposited at the bottom of the layboy to the left of the good sheet stacker. A sheeter-sorter of this design can produce sheets over a speed range of 100 to 800 fpm (and above) at a maximum of 200 cuts/minute in widths from 10 to 65 inches. To minimize the length of machine and to eliminate the ambiguity of distinguishing between defects and spaces between good sheets, it is preferable to inspect the paper while it is a continuous sheet. Thus, the inspection device is located between the payoff reel and the pinch rolls which feed the paper to the cutter (Figure 1).

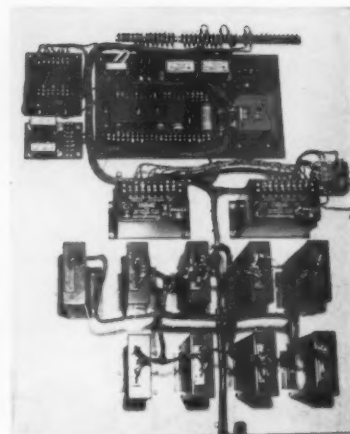


FIGURE 3: Transistorized panel is simple static control for automatically classifying sheets.

Use of transistor devices as shift register circuits provides a classifier circuit with operating speeds in excess of the maximum sheeter-sorter machine speeds. Static transistor relay circuits (Figure 3) and proximity switch elements eliminate all moving parts to provide maximum reliability and repeatability with a minimum of maintenance. The shift registers are similar to stepping switches except that they perform without any moving parts. The function of the shift registers is to store information from a signal source (the fault detector) and to transfer this information in time with a clocked signal called the shift pulse. The only external signals needed, other than the fault signal, are a shift signal which occurs when the trailing edge of a sheet passes the inspection point and a gate signal which checks the shift registers to see if a fault signal is present in the last register stage being used.

The general block layout of the automatic sheet classifier circuit is shown in Figure 4. The circuit is almost completely static. The only moving part is a master control relay in the power supply. This relay functions to provide a power failure signal to all shift registers on initial startup. The signal assures proper setup of the control circuit. This causes reject of all paper between the detector and the cutter on startup and eliminates faulty operation which might occur due to improper circuit conditions. The circuit is then ready to function as controlled by the fault detector.

Referring to Figure 4 the classifier

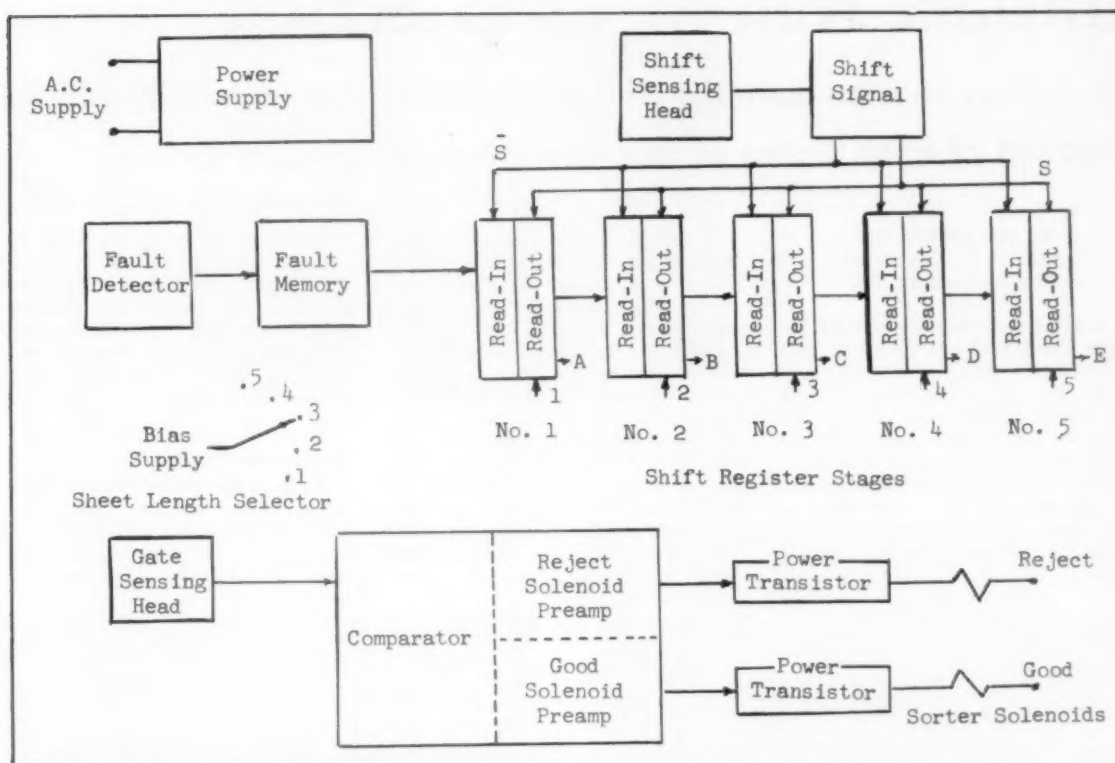


FIGURE 4: Transfer of equivalent sheet data in synchronism with flow of paper through machine handled by shift register techniques.

setup and function are as follows. The fault detector on fully automated sheeters-sorters is a photoelectric or similar scanning device. In semi-automatic operation the fault detector is a human operator visually scanning the continuous paper as it passes a reference line and pressing a pushbutton when a flaw in the paper passes the reference line. In either case the fault signal is usually only a momentary pulse which must be stored until it can be utilized by the classifier control.

There are two additional signal sources. These are the shift signal and the gate signal. Although these signals are generated in the same manner, their setting and function in the classifier circuit are quite distinctive. The signals are generated by adjustable cam segments attached to the rotary cutter which pass by proximity switches that give an output signal whenever the cam passes within proximity of a pickup device. It is not necessary for the cam to touch the pickup device. The device depends upon a magnetic pickup.

Signals for shifting the sheet position data in synchronism with the

actual flow of paper from the inspection point to the cutter are obtained from the shift sensing head. Since one revolution of the cutter represents one sheet length, the pulse wheel provides one pulse for each revolution of the cutter as shift register information to transfer an apparent sheet length from the inspection point to the cutter. In most instances the distance from the inspection point to the cutoff point will represent an integral number of apparent sheet lengths plus a fraction. Information in the shift registers must pertain to whole sheet lengths. Thus, the shift signal is delayed by retarding the shift cam to allow the whole sheet to completely pass the detector.

The reject gate is controlled by signals from the gate sensing head pulse wheel. The gate signal provides a time delay in the operation of the reject gate to permit the preceding sheet to clear the operational area of the reject gate before the gate changes its position. Usually fix mounted, the gate sensing is delayed upwards to a full revolution depending upon the size and flow characteristics of the paper.

The sheet classifier scheme is sim-

ple to set up for operation with the sheetier-sorter. The operator merely sets a selector switch for the particular sheet length to be cut. He sets the pointers on calibrated wheels of the shift and gate heads also for the sheet length to be cut. The classifier is then available for instant use. Shift signals generated by the shift sensing head take the fault signal originated at the fault detector and progressively shift the fault signal from the input to the output stage of each successive shift register. When the gate sensing head signal and shift register output signals coincide, the respective reject gate solenoid is operated to shift the gate position.

The automatic sheet classifier permits realization of automated finishing room operation. The control scheme is simple in design, easy to adjust, free of moving parts and electronic tube circuits and easy to maintain. Its relatively small investment cost results in continued repeatability of high production rates with consistent quality inspection.

Consistent quality inspection with a minimum of attendant personnel reduces the cost per cut sheet.

Impact Mill in Chip Sizing

... is best, says an authority who claims better size uniformity without creation of fines. Series of laboratory tests is reported

By LEE EBERHARDT
Asst. to the President
The Bauer Bros. Co.

● Considerable industry interest has been devoted to pin chipping, chip fractionation, chip uniformation, chip sizing, etc., in an effort to produce a uniform, easily-impregnated wood chip for further processing. This interest is based on the theory that the ratio of liquor impregnation into wood is approximately six to ten times as fast along the long fiber axis as is impregnation perpendicular to that axis.

It would appear that a pin chip with a length-to-diameter ratio of 6-to-1 would be very rapidly and uniformly impregnated and cooked to a uniform end product. With this objective, the industry has applied a wide variety of equipment, including disc mills, hogs, hammermills, impact mills, disintegrators, etc., with widely varying results. The main objections to results obtained are excessive loss due to fines, packing tendencies of material in bins, blowpipes, etc., non-uniformity of end products and difficulty of handling pin chips in conventional equipment later in system.

It was soon found that, while the material impregnated and cooked rapidly, difficulty in liquor circulation resulted; and capacity of digesters was reduced due to lower per-cubic-foot weights on pin chips as compared to chips. Considerable dusting in handling is also a serious mill problem.

Commercial Trials

An investigation of chip sizing using an impact mill and a single disc mill was undertaken with commercial equipment under a variety of conditions. The objective of the work be-



FIGURE 2

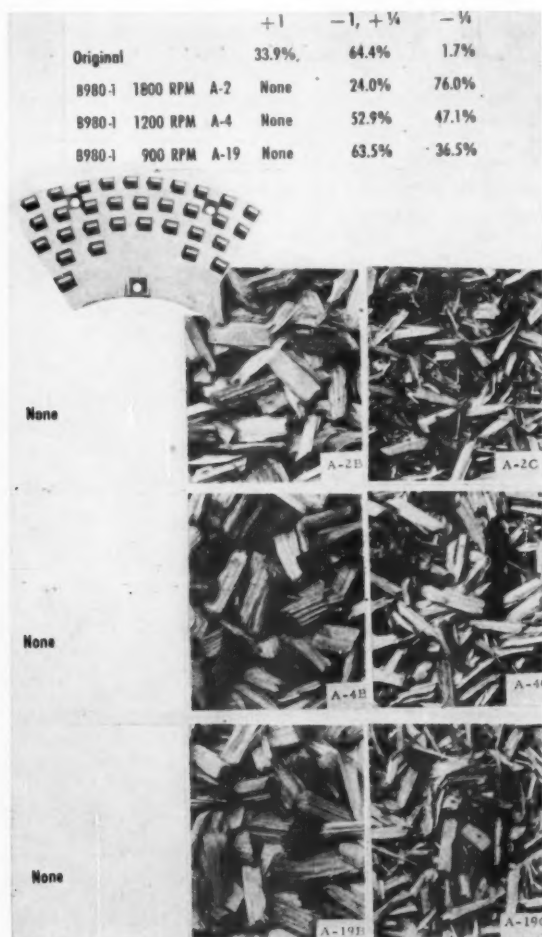
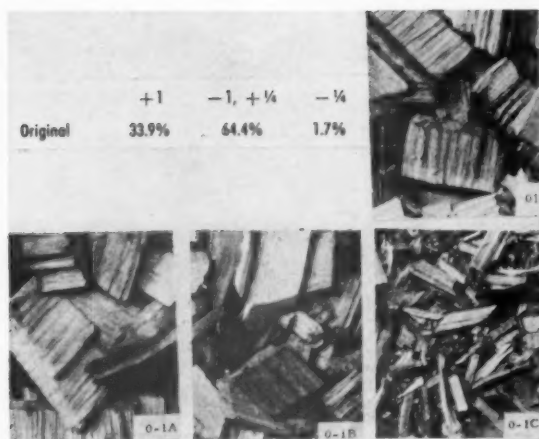


FIGURE 3

FIGURE 1



ing that of providing a uniformly-sized material in the belief that such a material, when subjected to a uni-

form further processing, will produce a more uniform end product with reduced process time.

Impact Mill

The impact mill, a slow-speed heavy-duty type hammermill, was investigated with three grate bar spacings (1/2-, 1- and 1 1/2-in.). Screen analysis of the feed material and end product was made. The results are indicated in Figs. 1 and 2, tables and photographs. All photographs are 1/2 actual size.

The results obtained are as would be expected in that the closer the grate bar setting, the more work done on the raw material. In all cases power requirement was less than 1-hp day per ton. Decreasing grate bar spacing provided a modest increase in the number of fines, but the uniform middle fraction in each case was very close to 90% of the input. The small percentage of oversize material (2.5 to 3.6%) would normally be removed by screening and recycled to the unit.

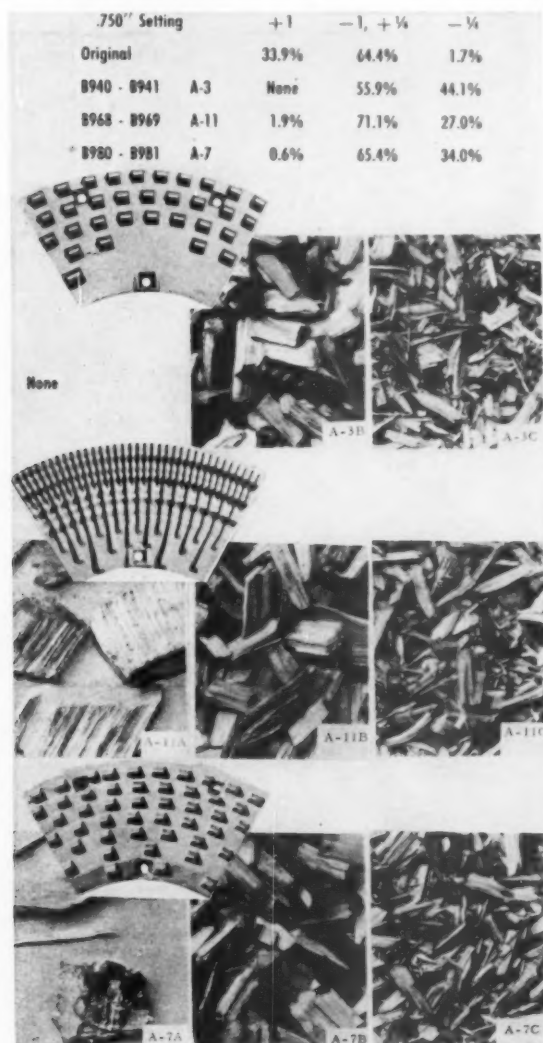


FIGURE 4



FIGURE 5

... Impact Mill in Chip Sizing

The mill utilized for this work differs in several major respects from most hammermills. Grate bars are used instead of a screen; the chips are fed to the upcoming side of the heavy-duty hammers, which impact them against a breaker section on the upper quadrant of the unit, and the material then drops through the grate bar spacing when sized. Speed of operation is relatively slow (450 to 900 rpm).

Excellent commercial results of this type are being produced in the Masonite Corp. plants at Ukiah, Calif., and Laurel, Miss., and at the Sunbury, Penn., plant of Allied Chemical & Dye Corp.

Single Disc Mill

Used for this work was a conventional 36-in. dia. single disc mill unit, many of which are installed in the industry. A variety of plate types, speeds and plate openings were used in the evaluation. Power requirement in all cases was less than 1-hp day per ton.

Effect of Speed

Fig. 3 illustrates the results obtained using heavy-toothed type plates operating at speeds of 1800 rpm, 1200 rpm and 900 rpm. The screen analysis of end-product indicates an increase in acceptable middle fraction and decrease in amount of fines. As the speed is decreased, the percentage of undesirable fine fraction, however, is too high even at the minimum speed (900 rpm) tried.

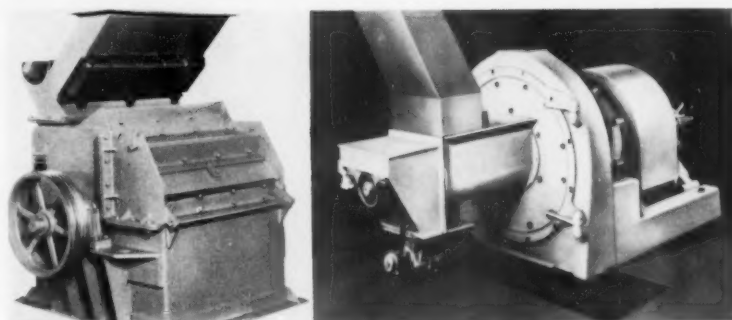
The series illustrated was run on hardwood chips with a moisture content of 50% B.D. solids. Subsequent runs at different moisture levels indicate moisture content is a major factor in chip sizing. Particularly in the low moisture range from 70% B.D. solids to air dry. A 20% reduction in moisture has a greater effect than reducing disc mill speed from 1800 rpm or 1200 rpm or 900 rpm.

This series of runs indicates excellent size reduction but only at a prohibitive production of fines.

Effect of Plate Type

Fig. 4 illustrates the results obtained utilizing three common types of pin chipping plates. In each case, the single disc mill was operated at 1200 rpm at the same running clearance between the plates.

This clearly illustrates the superiority of wave-line type (B968-9) plates over the toothed types. The fines again were extremely high in all cases, the lowest (27.0%) being on the wave-



IMPACT MILL (left) took material shown in Figs. 1 and 2. Single disc mill (right) was used for tests in Figs. 3, 4 and 5.

line type. The middle fractions were quite uniform, but percentages low.

Effect of Clearance

Another series using the wave-line (B968-9) type plates at 1200 rpm, but with clearances of 0.25 to 0.75 between the plates was run. The results obtained are shown in Fig. 5 and indicate excellent sizing of material at all settings, but again a high percentage of fines is produced. The percentage of fines increases as clearances are reduced.

In commercial operation, the selection of screen sizes in the screen room would become very important. A $\frac{3}{16}$ - or $\frac{1}{8}$ -in. fine screen would be utilized to salvage the sizable volume of usable material from the indicated $-\frac{1}{8}$ fraction. The $+1$ -in. fraction would also be recirculated from the screen back to the chip sizer for further reduction.

This work indicates a distinct advantage of the impact mill over single disc operation. There is a possibility, however, that the latter could be improved with tackle modifications, but it is doubtful that any changes would bring the fines produced to an acceptable level.

Analysis of Results

1. Dryness of wood is the most important variable in chip sizing, due to a dry brittleness that leads to shattering by either disc or impact milling.
2. Under no conditions of operation did the disc mill produce a uniform material. Fines were excessive in all cases.
3. Impact milling produces an excellent uniform material with a minimum of fines.
4. Reducing speed of disc mill operation from 1800 thru 900 rpm indicates slower speeds produce best results.
5. Fractionation, pinchipping, uniformation, and/or chip sizing to produce a uniformly fine material for further processing with a disc mill results in larger size variation and size distribution in the end product than found in the entering chip raw material.
6. If the purpose of chip sizing, fractionating, uniformation, etc., is to produce a uniform material that is to be subjected to a uniform treatment to produce a uniform end product, the disc mill is unsatisfactory.

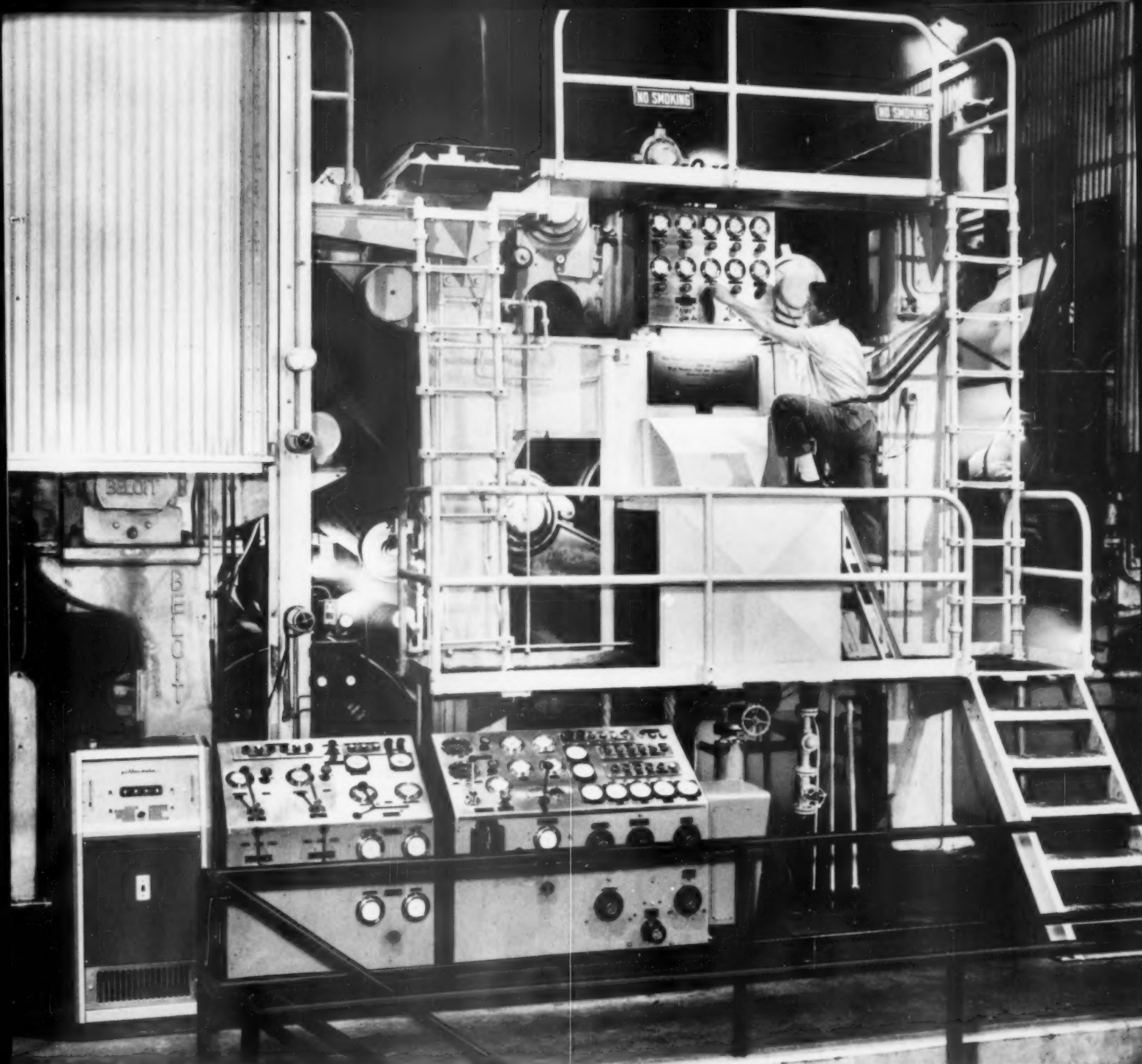
Safety Congress Set for October 17-21

Safety problems in all major operations of the industry will be discussed during the forthcoming sessions of the Pulp & Paper Section at the National Safety Congress. The meeting is scheduled to be held October 17-21 at Chicago.

Various round table discussions will be keyed at the opening general meeting by Hugh A. Black, director of industrial relations for the Mead Corp., Chillicothe, Ohio.

Speakers at the four-day meeting

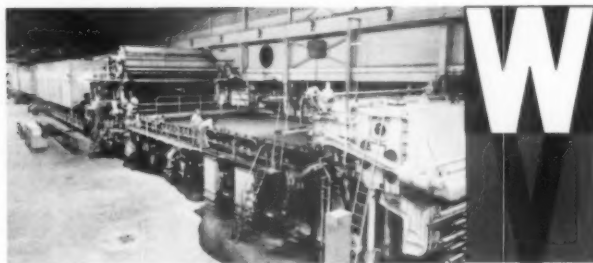
will include: Jefferson Keith, safety officer, American Pulpwood Assn.; Robert M. Gilmore, gen. safety supervisor, Rayonier Inc.; Kenneth Boober, St. Regis Paper Co., Bucksport, Maine; Harold Hewitt, asst. personnel mgr., Bemis Bros. Bag Co.; Karl F. Simpson Jr., director of industrial relations and safety, Folding Paper Box Assn. of America; O. B. Eustis, plant mgr., Abitibi Corp.; Julius A. Draper, safety director, Consolidated Paper Corp. Ltd.



S. R. CHRISTENSEN

Extensible Unit, No. 3 Machine, Charleston, South Carolina

West Virginia Pulp and Paper Company, Kraft Division

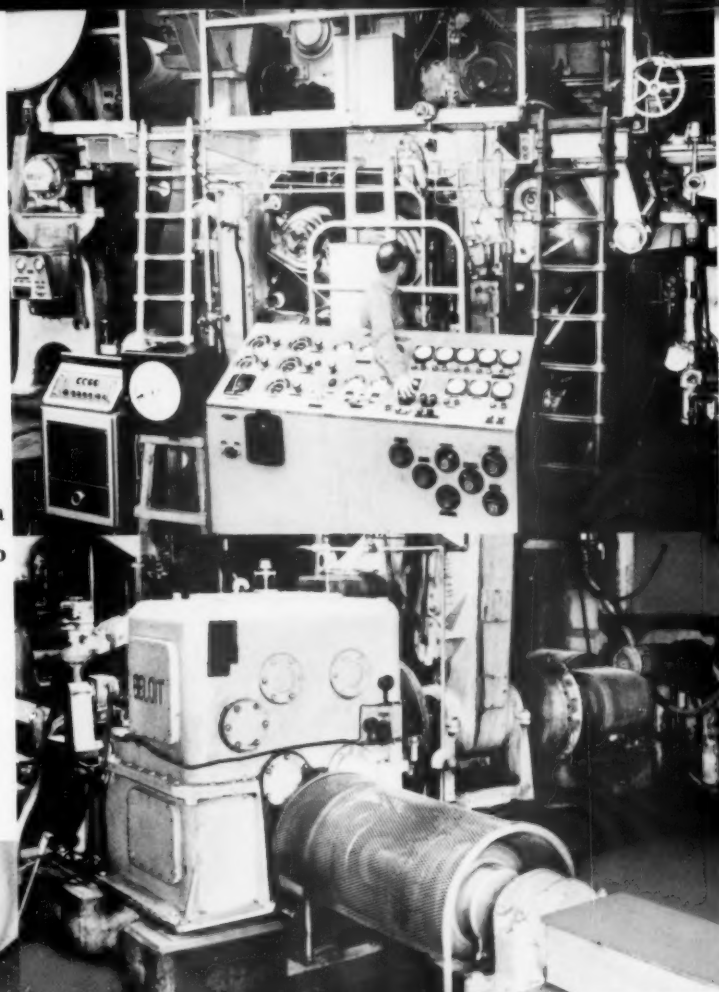


Above is seen the first unit installed for the commercial production of CLUPAK® extensible papers—a process pioneered by West Virginia. Today, 12 of these units are in production, and this new stronger paper is meeting with wide acceptance. Machine at left is one of two at Charleston manufacturing West Virginia's brand-named Kraftman CLUPAK paper. Please turn page.

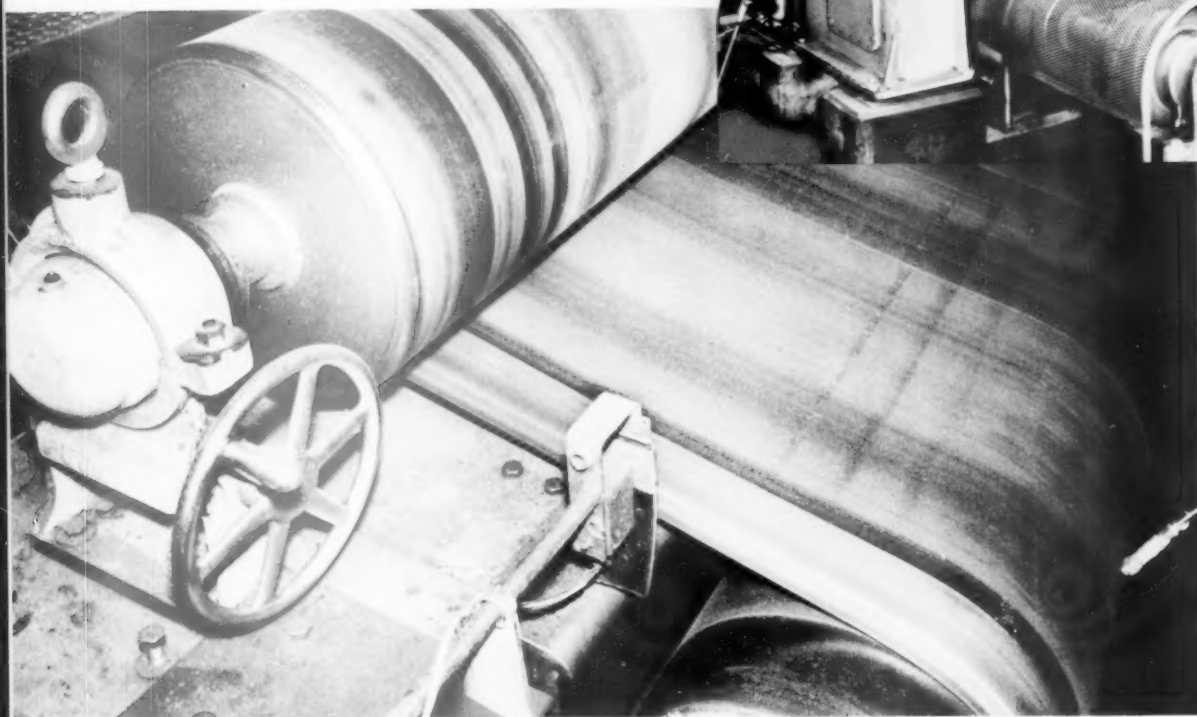
*Clupak, Inc.'s trade-mark for extensible paper manufactured under its authority and satisfying its specifications.

Two machines at Charleston manufacture Kraftsman Clupak

The patented CLUPAK process, hailed as one of the important developments in modern papermaking, brings a new "dimension" to paper: controlled stress and strain properties. To date, production has been in the kraft grades, although principles of manufacture and characteristics are applicable to all grades. Clupak, Inc., has appointed Beloit to build extensible units under patents owned by Clupak, Inc. (a) Extensible unit, number 2 machine. This is the second production unit installed for the manufacture of CLUPAK papers. (b) Drive side number 3 machine. Extensible unit is powered by a Beloit mechanical differential drive. (c) Detail of rubber blanket at guide roll



a
b



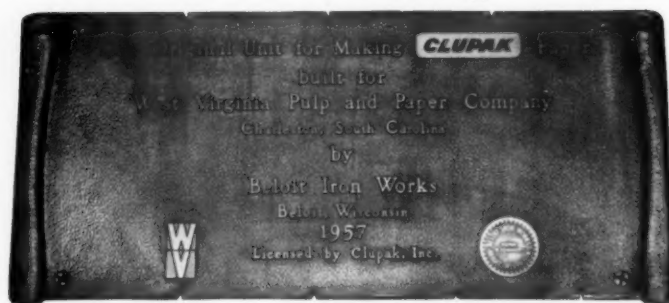
c
d

position—automatic air guide is at opposite end of the roll. (d) Close-up of plaque mounted on extensible unit, number 3 machine.



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This insert photographed on Westvaco's Pinnacle Offset.

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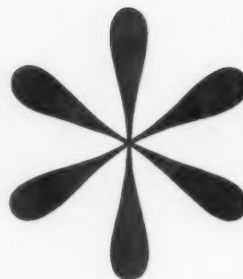


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Full Line of Attachments—Special material buckets, side dump buckets, forks, cabs, etc.

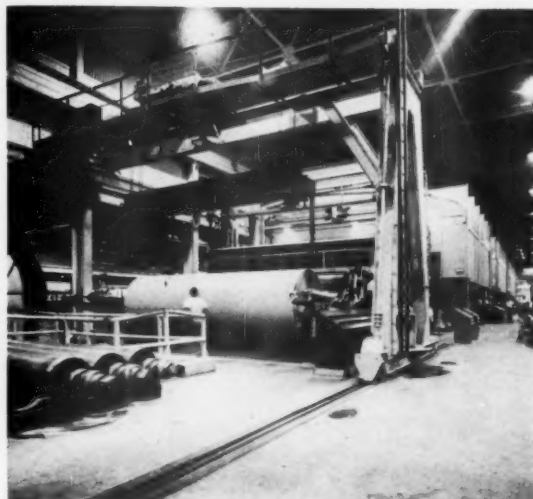
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**TRAXCAVATORS
ARE MAKING OTHER
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WOOD INVENTORY IS UNDER FIRE IN SOUTH . . .



WHERE DETERIORATION MAY BE AFFECTING QUALITY . . .

Areas for Observation:

Wood Inventory; Production

APA meetings stimulate ideas on these provocative themes as Southern spokesmen trade philosophy and practicality

1. Wood Price Up . . .

For years low cost stumpage and abundant, low cost labor have been the two determining factors in the evolution of Southern wood harvesting methods. But times are changing. Southern procurement chiefs have adjusted to gradually climbing labor costs. Now the price of wood itself is going up. And to add another woe, the labor force is declining as workers leave for other areas, higher paying jobs.

In pointing up these jarring facts, Champion's A. W. Nelson of Canton, N.C., put new notes to an old Southern song—the need for increased mechanization in the woodlands. "To keep competitive . . . we are going to have to come up with something that will produce as much again . . . as the chain saw . . ."

Machines which pick up walnuts,

dig potatoes, package fruit and other tasks considered impossible a few years back have been developed at the expense of time and money by machinery manufacturers. Warns Mr. Nelson: "The forest products industry has always been considered as having an abundance of labor and not prone to accept mechanization . . . it is time for an industry effort to let the machinery manufacturers know there is urgent need for machinery design investigations in this field."

While the complex and expensive machinery used in oil fields, petroleum, excavating, sand processing and other industries is kept on a round-the-clock basis to make the cost reasonable, pulpwood equipment is usually in operation about 40 hours a week and 90% of the trucks used are more than six years old. In contrast, heavy machinery which is paying for

itself in other industries works as much as 168 hours a week. With paper and paperboard in strenuous competition with highly mechanized glass plastic and other industries, his warning took on added muscle.

Earlier at Charleston, S.C., International Paper's Carl Brown made an equally apropos comment: ". . . the main justification for foresters and woodlands employees is the delivery of pulpwood to our mills at a reasonable cost . . . if we fail to keep the cost reasonable I suspect strongly we can expect our end product—paper—to be replaced . . ."

2. Slow to Accept Machinery . . .

An example of the industry's slowness to accept new machinery—or perhaps its apathy—is the Harrison Pulpwood Harvester developed by Columbia, S.C., manufacturer Gaines

THE PULPWOOD ARENA: NEW TRENDS, TECHNIQUES AND THREATS

1. New thoughts on pulpwood threats.
2. New machines slow in acceptance.
3. Advantages vs. disadvantages of inventories.
4. More observations on outside chip storage.
5. Pros and cons of long-length logging.
6. Another look at clear cutting and planting.
7. Newsprint demand tight four more years.
8. Floridians organizing new safety group.
9. FM radio access endangered.
10. Genetics in Southwest faces setback.

A wealth of information is available to woodlands people in the South and other regions of the U.S. in these highlights from two important American Pulpwood Association meetings, one at Shreveport, La., the other in Charleston, S.C. S. K. Hudson, of Container Corp. of America, Brew-

ton, Ala., is chairman of the Southwestern technical committee; H. H. Flickinger, International Paper Co., Georgetown, S.C., is chairman of the Southeastern Committee. Jim Holekamp, Southern Logging Engineer of the APA serves as secretary for both.

Harrison and I.P.'s Carl Brown. Although highly touted by many progressive woodsmen, current production of this machine is going largely to the pipeline industry.

As one APA observer said: "The Southern pulpwood industry has not yet given substantial recognition to the potential value of the machine's unique mechanical hand, arm and back. It is an efficient materials handling tool and can replace two or more men handling pulpwood by hand . . . the cost is reasonable . . ."

Another example: The Bombardier and Pulpwood Trailer which is no longer in operation although many thought it displayed promising results under tests. One possible reason for

its early demise: Too light construction. Another more skeptical observation: It's radically new (for the South) system of logging never caught on.

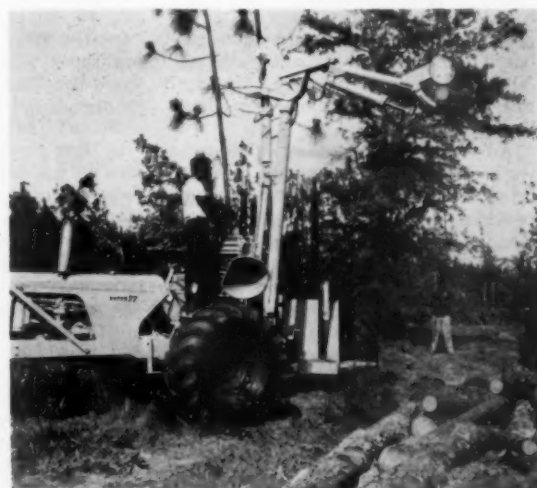
Encouragingly, the demise of some machines has not dampened the enthusiasm of some developers. Tom Busch, International Paper's skilled woods chief, is currently working on modifications of his Buschmaster and Busch Combine, two highly versatile woods machines. And a steady production of the comparatively new Terrain Master is going into South Georgia and Florida with satisfactory reports on its operation.

3. Wood Inventory, Pro, Con . . .

"Recent studies of pulpwood show

definite losses in both yield and strength after storage . . . beginning as soon as wood is stored. They are higher for wood cut during the fast growing spring season than wood cut at other times." So commented C. R. Haynes, coordinator of International Paper's Southern Kraft mills, at the 1956 TAPPI Alkaline Pulping Conference.

With wood inventories now coming under the microscopic eye of many quality control supervisors and managers, Mr. Haynes' remarks four years ago now become more significant than ever. Add to this the fact that pulpwood production under today's operating conditions is becoming more seasonal in nature than ever before



WARNING TO SOUTH came from several speakers who foresee need for revolutionary equipment to overcome loss of labor force, increased wood prices. Some feel chain saw, left, was last important tool to be universally adopted. Yet many manufacturers like Gaines Harrison have developed machines such as Harrison Pulpwood Loader, right, which are now being used by competitive industries because pulpwood was slow in recognizing attributes, wary of accepting them.



LONG-LENGTH LOGGING OUTWEIGHS short wood logging says one company. They report saving of fiber, both in loss of sawdust and fewer ends going to chipper.

with mills facing increasing pressures to buy fiber when available and the question becomes a big one. Where do you begin to sacrifice quality to maintain enough raw material on hand to guarantee uninterrupted operation?

Part of the answer was provided at Shreveport by J. M. VanHoose, mgr. of International Paper's Natchez mill. Each mill, he contends, must carry out studies and determine grades of pulp and paper it produces and effects of wood deterioration on these grades. Inventories should then be based on these qualifications. Wood 30 days and older should go directly to the barking drum when it reaches the yard.

Advantages of keeping a sound working inventory: Assurance of continuous operation; wood procurement provides steady and relatively even wood flow; better quality and cheaper wood by eliminating the necessity of procuring wood on an emergency basis during adverse weather conditions and production fluctuations; more uniform age of wood to the process which results in more uniform quality control of the finished pulp and paper; pulpwood producers are assured of a regular market.

The disadvantages: Added cost of handling wood to and from storage; possibility of some wood becoming aged; necessity of maintaining proper storage records. Mr. VanHoose contends, and the facts seem to back him

up, that economically and operations-wise, the advantages of maintaining an adequate wood supply far outweigh the disadvantages.

4. Ideas for "Cold Storage" . . .

The diametrically opposing forces of quality versus procurement have added needed impetus to the question of outside chip storage in the South. Observers feel that if outside chip storage can assure a degree of "cold storage" for chips and chip quality it can wipe away much of the high cost associated with present day roundwood handling and also give the mill its operational guarantee.

Since PULP & PAPER's Lou Blackerby first threw added light on this idea in his September, 1958 article, progressive southerners have been taking a long, hard look at outside storage. One of these is St. Regis' Tom Baker, who believes, "The deterioration problem of wood in storage must be solved . . . inventories must act as a surge tank between mill and woods operations. Outside chip storage could be the answer . . ."

Impetus has been given to this system by studies in outside chip storage currently underway or completed at Olin Mathieson's West Monroe, La., mill, Buckeye Cellulose in Foley, Fla.; East Texas Pulp & Paper; Brunswick Pulp & Paper (studying hardwood chips at present), North Carolina Pulp, Sonoco Products, the U.S. Gyp-

sum Corp. and the U.S. Forest Service. Some are already going ahead with piles based on their research. At Counce, Tenn., the new Tennessee River Pulp & Paper Co. will have a 10,000 cord pile and Gulf States Paper Corp. stores chips outside using Rader Pneumatics equipment to handle them.

General conclusion drawn from most research, says Mr. Baker, is that outside chip storage has no more deterioration effects than roundwood in the yard. While this is a somewhat negative report, it still opens the door for greater use of chips and clears the way for more meaningful studies of the economic questions involved.

Some of these are worthy of careful consideration: Emphasis on better wood utilization; a partnership with the lumber industry; chipping in the field; tree-length wood logging, economical wood storage. The cost of a chip silo is 12 times that of a chip site. One mill now researching chip storage reports that handling cost of chips into and out of storage is one-half the cost of handling roundwood. Another states that outside chip storage and allowed expansion of purchased chip property will afford a \$100,000 a year saving on a medium-size mill.

These considerations are sweeping enough to lead Mr. Baker and others in the South to feel that outside chip storage is perhaps the most universal answer to this problem to date.

5. Logging the Tree . . .

Another project gaining advocates in the South is long-length logging. Among them is E. K. Ach, North Carolina Pulp Co., who commented at Charleston: "We are not only finding advantages of long-length logging in the woods but at every step of the way from the purchasing of the stumpage to its final discharge into the debarker."

Initial studies, said Mr. Ach, show that it takes as long or longer to unload trucks carrying short wood into the yard. North Carolina Pulp hopes to improve its long-log unloading even more with purchase of a LeTourneau 30-ton log stacker. Another benefit: Railroad pulpwood freight rates do not apply to long log lengths.

A cost engineer at Plymouth reports that cutting logs into six ft. lengths at the mill prior to debarking results in fewer cuts per tree, a saving of fiber both in loss of sawdust and fewer ends going through the chipper. A 4% saving through reduction in waste and higher output is equivalent, he said, to a normal profit on an increase in sales of 20%.

J. R. Farrell of Buckeye Cellulose

in Foley, reports other advantages. Logging crews are equipped to produce from wet and rough areas with little or no lost production; crews produce wood more economically; availability and quality of labor supply is increased because hard physical work of short logging is reduced; in event of mill emergency sawlogs can be diverted into pulpwood.

At Union Bag-Camp in Franklin, Va., W. A. Turner reports a study of long-length logging. Advantages of long logs: More production per day, less trucks, work more days, use less labor, work not so hard, load rapidly, less waste. Advantages of short wood: Less investment, adaptable to rail shipment, stacks neatly, equipment not a necessity, less know-how needed, can operate poorer timber, partial cuts leave less damage, can move quicker. In view of the production and labor advantages of long-length logging alone it appears certain to gain wider acceptance in the South.

6. Harvest at Planting Time . . .

There is an increasing trend in the Southeast toward clear-cutting, planting and cultivation, reflected by increasingly widespread use of mechanical equipment for site preparation. Machines which were being demonstrated as recently as three years ago are now considered as operational in many mills. In addition, encouraging progress is being made with the furrow seeder and other direct seeding machines.

International Paper's Carl Brown, of Georgetown, advocates increased attention to such practices. "To accomplish a low and reasonable cost of raw material," he said, "we must have a minimum outlay of capital for land management and low harvesting and delivery cost which reflects efficient operations . . . they can't be divorced . . . cost of growing and harvesting end up in total cost of wood delivered to the mill."

Aware that the subject is a controversial one, he points out that the South must develop shorter rotation periods for pine. "The small landowner who owns 80% of the South's timberlands can't wait 80 years to harvest his crop," points out Brown.

He also raises the question of how much of the expense of girdling and poisoning hardwoods is attributable to selective cutting, and how economical selective cutting is in the long pull. "Under selective cutting," he says, "the next crop can be no better than the seed trees presently growing . . . clear cutting and planting gives us an opportunity to give the tree a chance from the time it starts growing—not 20 years later when it has had to

struggle to live."

In the field of genetics, too, the practice has much in its favor. "It's hard for me to believe," he says, "we are going to take seed . . . produced from expensive genetics programs . . . and broadcast them over the land so we end up with too little or too much. If spacing is good business later, why isn't it good business 20 years earlier?"

His remarks in some respects reflected what Champion's Mr. Nelson had said earlier: "It took 20 years to develop the cotton picker when just a few years ago the skeptics said it couldn't be done. As long as cotton was scattered around over the land, mixed with other crops, it was almost impossible to develop the machine. Cotton is now grown in rows and makes mechanization easier."

"We can all visualize a machine that could sever the tree at the stump, debark it, chip it, and load it in a transporting unit in one operation," concluded Carl Brown. "But it can only be done if we have the trees in rows. The place to start harvesting is at planting time. . . ."

7. Newsprint Quality . . .

Competition in the newsprint field is keener than ever and quality can make the difference between customer acceptance or rejection. George Clark, vice pres. of mill operations at Southland Paper Mills, Inc., told the Shreveport meeting that capacity for newsprint manufacture greatly exceeds the present demand, so customers can well afford to be choosy. Mr. Clark sees this condition continuing for possibly four more years until demand (growing at 3% annually) catches up with newsprint production capacity.

He said that quality control is considered a key factor in wood control and in the inventory policy at South-

land. Because a very high percent of the sheet (75 to 80%) is mechanical pulp which immediately reflects any blue stain or degradation of pulpwood, Mr. Clark warned newsprint manufacturers to be more mindful than ever of quality in the woodyard.

8. New Safety Measure . . .

A Florida Woods Safety project is currently being organized, according to C. Mathewson of St. Marys Kraft Corp. Interested Florida mills will contribute to a special APA fund for the hiring of a safety engineer to work with pulpwood producers in Florida on wood safety. Aim: Reduction of accidents in pulpwood production in the state thereby stabilizing the rising Workmen's Compensation rates in the state.

9. FM Radio Warning . . .

FM portable radio use by forest products industries in the South is diminishing and frequencies allotted the industry may be shared with the petroleum industry. APA reports the petroleum group is putting pressure on FIRC to share available spectrums. This will probably spread to the Southeast.

The big threat, according to some observers, is that this important communications tool may not be available to companies which have been slow in adopting it when they look for it three or four years from now.

10. Genetics Slowing Down?

Some companies feel that long-range tree genetics programs established by companies in the Southwest are dangerously slowing down. One reason: Highly-trained experts are being attracted into higher paying jobs in the Southeastern region, where genetics programs are on the increase.

Chart to Simplify Forest Inventory Work

A parallax-factor alignment chart, with instructions for use, has been prepared by David A. Bernstein, a member of the Pacific Northwest Forest & Range Experiment Station's aerial survey techniques research project. The forest survey aid is reported in the Portland, Ore. station's recent Research Note No. 183.

As pointed out by Mr. Bernstein, "photo-mensuration techniques are often used in obtaining elevation differences in areas where topographic maps are unavailable." These differences can be ascertained by applying simple instruments such as a parallax wedge or parallax bar.

Measurements are made on photos

in terms of the difference in instrument readings between the upper and lower points to be measured (parallax difference). These differences can be translated into elevation differences by means of a parallax formula or, more simply, by the use of the alignment chart presented in the experiment station's report.

Although the accuracy of measurements with the equipment is not as high as that obtained with the complicated plotting instruments used in topographic mapping, Mr. Bernstein points out that experience has shown that elevation differences can be measured within $\pm 10\%$ two times out of three.



TREE IS SHEARED at ground level by International Paper Co.'s Combine. Machine then picks up tree, delimbs it, cuts it into pulpwood sticks, loads the sticks into a cradle and deposits them, a cord at a time, in vertical bundles.

The Combine — IP's "Magic Machine"

Sixteen cords a day now possible with two-man crew and new machine that fells, delimbs, bucks and bundles logs in one operation

● Ever since the first chain saw gnawed its way through a pine tree and carved a new era in Southern pulpwood production, progressive woodsmen in the South have been looking to mechanization as a salvation.

It must come. The labor force is continually migrating North, prices of stumpage continue to inch skyward and mill managers seem to be at harmony on at least one song: the place to cut costs is in the woods.

Some far-minded Southerners were bold enough to believe that there was possible a machine which could do a half-dozen different jobs; a combine which would tear down a tree, chew it up and file it away and spit out the branches like used toothpicks.

For the past two years, rumors have been buzzing around Southern woodlands like bluebottle flies. They said that International Paper Co.'s veteran woodsman Tom Busch had indeed invented a magic machine. "It'll do everything but eat grits," said one woodlands engineer at a recent American Pulpwood Assn. meeting. Another engineer, on telling of seeing the machine on a tractor in the square of a small Louisiana town, spoke in

awe as though he had seen the headless horseman guzzling a chocolate soda in a Sleepy Hollow pharmacy.

When APA's Jim Holekamp finally got pictures of the machine in action, the sternest skeptics watched the film in open-mouth wonder.

Now the wraps are officially off and International Paper has released full detail on the machine which they consider out of the "X" stage.

Prototype Harvester

The Busch Combine, International Paper's prototype pulpwood harvester, drives up to a pulpwood-size tree, shears it at ground level, leaves no stump, picks it up, pulls it through a delimbing device and, at the same time, slices it into 63-inch sticks. It does all this in less than two minutes.

It does more. Catching the sticks in an attached cradle, it binds them, a cord at a time, and deposits them in a vertical bundle for another super-machine to pick up and load on a trailer.

The entire process is semi-automatic. In an eight-hour day, with only an operator and a helper, the machine can cut and stack 16 cords of pulpwood, day-in and day-out,

throughout the year. By contrast, a top-flight, two-man crew, working with chain saws, can harvest and stack an average of four cords during the same working day.

The machine that promises to make this revolution in the woods is the result of seven years' work by Tom N. Busch of International Paper Co., in collaboration with the Timberline Equipment Co. of Bradley, Ill. Referred to by some as the "King Kong of the Woods," it was developed and tested at International's research station at Olla, La.

Basically, the Combine consists of a heavy duty tractor with four-wheel drive. It is ten feet high, eight feet wide, and is powered by a GMC Model 371 diesel engine with an Allison torque converter. A two-piece chassis allows either section to pivot or oscillate independent of the other, permitting all four wheels to maintain constant contact with the ground. Full 40° hydraulic steering is accomplished by cramping the machine in the center, providing snake-like action through trees and undergrowth. Tracking rear wheels provide a turning radius well within the length of the machine, and there are no trailer-

type steering problems since the machine handles in reverse with the same ease as straight-ahead travel.

Mounted on the tractor are two hydraulic cutting heads, one for shearing the tree at the base of the trunk, and the other for bucking it into pulpwood lengths. Both cutting heads resemble giant shears or scissors and can cut through trees up to 19 inches in diameter, quickly and cleanly.

A steel arm up forward lifts the tree onto a carriage which draws it through the delimbing device and into the bucking shears. The delimeter is a sharp, one-foot-wide, flexible, steel belt which is hydraulically operated. It wraps around the trunk and strips off limbs up to 5½ inches in diameter. The belt is spring-loaded and progressively contracts to fit the decreasing diameter of the trunk as the tree is bucked into the proper lengths. The sticks fall into a cradle by gravity. The cradle accommodates one and one-tenth cords, and when this capacity is reached, the wood is dumped in a vertical bundle and bound with wire.

I. P. envisioned the machine as being able to fell a tree with a minimum of manual labor while controlling the direction in which the tree would fall. They wanted to eliminate waste by having it cut the tree almost flush with the ground, leaving no stump or sawdust. The cut had to be clean, to minimize the damages of insects and disease. At the same time, they needed some quick easy way to delimb the tree, cut it into the required lengths, and stack the sticks on end.

This last requirement was important because, at that time, bundles of pulpwood were stacked lengthwise on the ground. When picking up a bundle with a crane or the like, someone had to pass a cable or chain sling

under and around the bundle. This was not only a tough and time-consuming chore, but snakes often gathered under the logs and workmen passing the slings beneath the bundles were frequently bitten. Vertical bundles would also eliminate the time lost in cutting and placing supporting sticks under the horizontal bundles.

In designing a machine to perform all these tasks, various specifications had to be kept in mind. For operating in the South, the machine had to conform to a certain length, width and height to comply with highway regulations. Otherwise, a special permit would be required every time the machine was moved over public highways or from state to state. The machine also had to be self-propelled and self-conveyed for travel both on and off the highways. In addition, it had to have built-in features to permit it to travel over rough terrain.

Concurrent with the development of the Combine was that of the Busch Loader. Designed to go where the wood is and bring it out, the Loader's job is to pick up the Combine's packages and load them on specially-designed trailer frames which are

shuttle-hauled over the highways to woodyards. These trailer frames are preloaded to eliminate waiting time for the highway truck-tractor.

Each package contains one and one-tenth cords and weighs from six to seven thousand pounds. To hug and lift the load requires hydraulic pressure up to 1500 lbs. psi.

"Most people have been skeptical," he grins. "To do all the jobs we now have the Combine doing, they thought it would have to be some kind of Rube Goldberg monstrosity. They can hardly believe their eyes when they see it in action as a fast, efficient, compact forest tool.

"We've come to the point now where we are not trying to devise new theories. Someone else will do that, no doubt. As soon as a machine like this hits the market, if it has any merit or potentiality at all, there are plenty of people who will try to emulate it or make it do something differently or better. What we're doing now is building in reliability."

Both the Combine and the Loader are manufactured by GarWood Industries, Inc., Wayne, Michigan, and sold and serviced by Timberline Equipment Co. of Bradley, Illinois.

POWERFUL SHEARS swiftly fell tree. One shears tree at base of the trunk, the other bucks the tree into pulpwood lengths at tractor height. Both cutting heads can slice through trees up to 19-in. dia. in seconds.



STEEL ARM LIFTS TREE onto carriage which then draws it through a delimeter and into the bucking blade. Pulpwood falls into the attached cradle at the left.



LOADER HUGS and lifts Combine's packages and loads them on specially designed trailer frames. A skilled operator can load 80 packages, each weighing 6,000 to 7,000 lbs., in eight hours.



CAT D7 TRACTOR WITH K/G BLADE CLEARS 10 ACRES IN 10 HOURS

You can see what the going is like in the woods being cleared by H. H. Ray, Bay City, Texas. His D7 with a Rome K/G Blade averages an acre an hour in a stand that includes heavy live oaks. The K/G Blade slices through small trees at a single pass, downs larger trees in a few passes, then shears stumps at ground level. Foreman Walter Clements says: "Mr. Ray still has his first D6 which he bought nine years ago. We now have three D6s, this D7 and a D8; and we wouldn't have any other make but Caterpillar. It stands rougher treatment and gives longer life with less expense for operation. And our dealer service is excellent."

NOW A NEW D7 SERIES D TRACTOR

The new D7 Series D Tractor is packed with even more power and greater operating economy than previous models. A new Turbocharged D339 Engine develops 140 flywheel HP, 112 drawbar. Improved torque rise boosts its lugging ability 80%. The D7 also features a new dry-type air cleaner, new stronger final drives, new lifetime lubricated rollers and optional in-seat starting. With all these and other new advances, it retains such proved features as the exclusive oil clutch, which delivers up to 2,000 hours of service without adjustment. For site preparation and other hard work, no other machine of comparable size can match the new D7 Series D.

Your Caterpillar Dealer has a file of facts about Cat Diesel Tractors on all phases of site preparation. He'll be glad to show them to you. He'll be glad to demonstrate the D7, too, with any of several available tools. Name the date! Caterpillar Tractor Co., General Offices, Peoria, Ill., U. S. A.



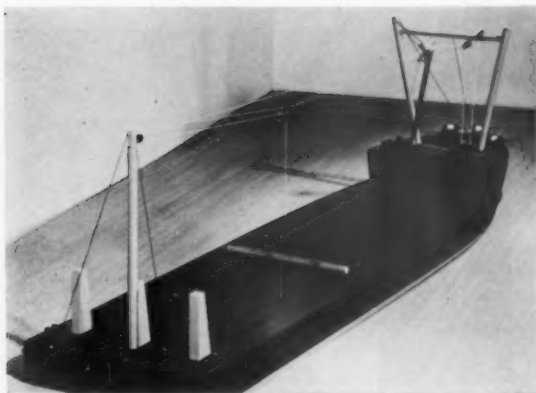
CAT DIESEL TRACTORS WITH ROME K/G BLADES CUT SITE PREPARATION COSTS 20% to 50%!

Compared with other methods, K/G Blades with all models of Cat Diesel Tractors have demonstrated 20% to 50% savings in clearing. Matching HP to the job application, the D4 is recommended for clearing brush up to 3" in diameter; the D6 for growth up to 8" in diameter; the D7 for growth up to 14" in diameter; and the D8 and D9 for use where terrain and timber require higher horsepower. The K/G Blade mounts on a "C" frame at a 28.5-degree angle with the tractor. A sharp armor-plate stinger projects 30" beyond the blade and easily slices through big trees... Paul Bunyan could never do it so easy.

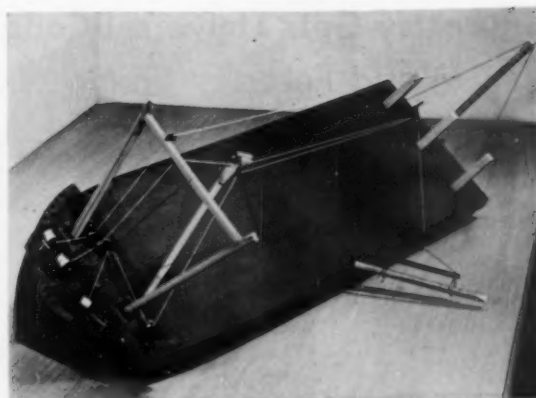
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**HEAVY-DUTY
WOODS EQUIPMENT
FOR THE HARD WORK**



ENTIRE SETUP of the new-type Ross loading and unloading system for the self-dumping barges is shown on this model. One of the advantages is that all the gear and rigging required are of the types which are used in conventional logging.



INCLINED POSITION does not interfere with effective operation of the system, according to the designer. When self-dumping barges are used, a few logs often are held up and jammed. The loading device is designed to pick them up and handle them separately when required.

New Type Log Loader

... for self-dumping barges has interested several companies. Device can be operated on docks or in logging camps

● A Vancouver, B.C., naval architect, Ian Ross, of Ross & Carius, has designed a new type of log loader for self-dumping barges, and several companies in the forest industry are studying his plans with interest.

The device could be operated on docks or in logging camps as well as on floating vessels with equal facility, according to Mr. Ross, provision having been made for both marine and shore-based applications.

Basic purpose is to lift and place loads quickly and efficiently with maximum safety and minimum amount of rigging.

Here are some of the system's features when applied to a log carrier: 1. It forms an integral part of the barge unit; 2. It can be adapted to new construction or existing barges; 3. All running parts are standard logging equipment.

The device can be rigged with one or more lifting points each of which can be operated by one man. The operator's control position affords a full view of the complete loading operation, and one advantage is that the system can be operated with the barge in an inclined position.

Three masts are involved in the Ross setup, the heights being governed by the types of load lifted. One

mast is placed at one end of a given area and the others at the opposite end. One of the masts is fitted with a boom; it is inclined at about 10 degrees to the horizontal, in the direction of the loads to be lifted.

The lifting line runs from the load up through the lower sheave in the carriages onto a swivel sheave in the head of the boom, down the boom to a swivel sheave placed outboard of the mast and deck, then through a horizontal sheave on deck and down to the winch drum.

A skyline is fixed to the other vertical mast and runs from there through a horizontal sheave in the boom head, then to a swivel sheave on a cross member between the two adjacent masts; from there to a fixed sheave below and to a winch drum.

A traveler is hung on the skyline to run between the head of the boom and the vertical mast. The traveler is pulled from the boom head to any location desired on the skyline up to the vertical mast by a line attached to the traveler and running through a swivel sheave at the head of the vertical mast; from there to a fixed sheave on the cross member between the two adjacent masts and down to a fixed sheave below.

When in operation, the boom is

swung in with the head of the boom in a line between the center of the cross member between the two adjacent masts and the single vertical mast at the other end of the loading area. The traveler is located at the head of the boom.

The skyline and the traveler line are run off their drums in the winch and by reason of the 10 degree inclined axis to which the boom is secured, the boom swings out under the control of the skyline.

When the cargo hook is over the load to be lifted, it is dropped from its drum on the winch, secures the load and is then lifted to the desired height. The winch then takes up the skyline drum and thereby swings the boom back to the starting position. Then the traveler line is taken in and the lift line let out at the same speed; the traveler and load move along the skyline to over the desired location on the loading area. The cargo lift is then dropped in the desired spot and the lift line taken in on the winch and traveler line let out, thereby returning to the head of the boom and the starting position.

The fact that all equipment used is of a type familiar to loggers makes the rigging and operation of the Ross system relatively simple.

Forestry Gets Universal Consideration At World Forestry Congress in Seattle



McArdle



Dunn



Stamm



Bromley



Heintzleman



Amidon

● The Fifth World Forestry Congress, now in two-week session at University of Wash., Seattle, is being attended by foresters throughout the globe. Attendance at the opening sessions indicates that predictions of attendance of 2,000 is not far off.

The aim of this world-wide conference includes (1) advancing the science and practice of forestry in its broadest sense everywhere, (2) exchanging information and developing personal associations of forestry leaders and professional workers, (3) stimulating and fostering cooperation in development and use of world forest resources. These objectives were outlined by keynote speaker Richard E. McArdle, chief, U.S. Forest Service, Washington, D.C., who opened the session's program. Dr. McArdle is chairman of the organizing committee, a group long involved in preparing for this conference, the first held in the Western Hemisphere.

Basically one underlying consideration pervades the program's ten major technical fields, the multiple use of forest land.

Specific forest subject categories of the program include silviculture and management, genetics, protection, economics and policy, education, products, watersheds, recreation and wildlife, operations, and tropical forestry.

Some 200 world authorities are participating in the program which ranges from surveying virgin timber lands to developing new uses for woods already a part of world market.

World Forestry Congresses have been held periodically since 1926 when the first one met in Rome, Italy. The 2d was in 1936 at Budapest, Hungary, 3d in 1949 at Helsinki, Finland, 4th in 1954 at Dehra Dun, India.

Featured speakers of pulp-paper sessions of the forest products section include Dr. D. T. Jackson and R. F. Bower, both of Hammermill Paper Co., Erie, Pa., J. N. Swartz, tech. dir. of Bowaters Southern Paper Corp.,

FIFTH WORLD FORESTRY Congress committee-men were: R. E. McArdle, chief of U.S. Forest Service, Wash., D.C.; P. M. Dunn, dir. of Forestry, St. Regis Paper Co., New York, N.Y.; E. P. Stamm, forest consultant, Portland, Ore.; W. S. Bromley, exec. sec., American Pulpwood Assn., N.Y., N.Y.; B. F. Heintzleman, former regional forester and ex-governor of Alaska, R. Richardson, mgr. Seattle office of Crown Zellerbach Corp., G. B. Amidon, dir. forest management, Minn. & Ontario Paper Co., Minneapolis, Minn. The Congress is held in Seattle, Wash. for two weeks. Foresters from all over the world are attending.



Richardson

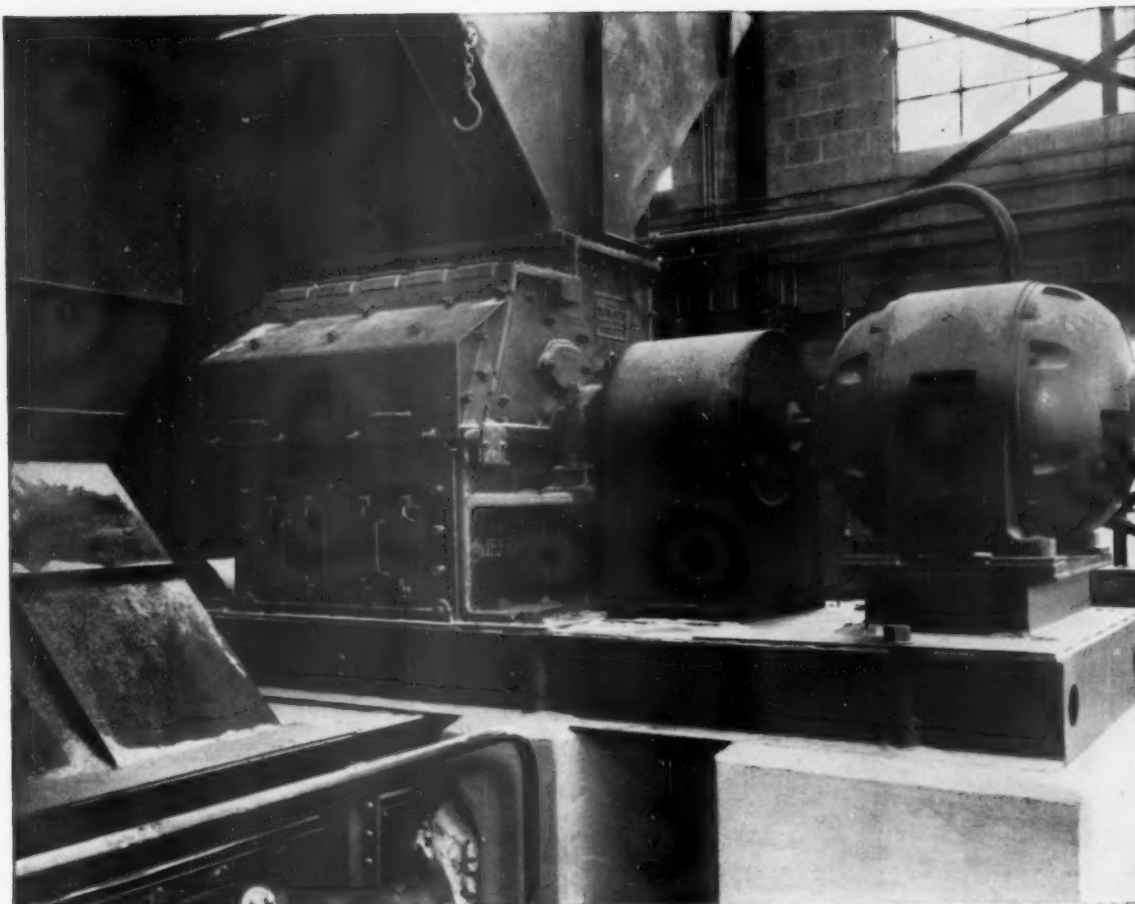
Calhoun, Tenn., L. J. Rys, mill mgr. of Cellulosa de Chihuahua, Chihuahua, Mexico, S. M. Temple, development div. of Australian Paper Manufacturers Ltd., South Melbourne, Australia, P. R. Sandwell, Sandwell & Co. consulting engr., Vancouver, B. C.

The largest concentrations of woods machinery and equipment ever displayed at World Forestry Congresses is being shown at the Seattle meeting. E. P. Stamm, formerly vice pres. in

charge of Pac. Coast timber for Crown Zellerbach Corp., now retired but doing consulting work, heads the exhibits committee as chairman. Machinery includes American and European equipment of more than 70 producers. Represented are both rubber tired and crawler tractors, power shovels, logging trucks, yarders, loaders, air tongs, chippers, gluing machines, fire suppression gear, and various types of equipment automation.

FAST, ECONOMICAL push button unloading is claimed for this Allis-Chalmers Mfg. Co. car shaker at the Palatka, Fla. mill of Hudson Pulp & Paper Corp. The 5-ton unit is one of the first of its kind used for wood chips. Starting, stopping, raising and lowering of the shaker is controlled by one man. Chips are said to flow freely through the bottom.





What's your reduction problem?

**A JEFFREY
SHREDDER
may be
the answer**

Bark and broken sticks of pulpwood from barking drums—oversize dry and green chips from wood screens—semi-refining of partially cooked chips; these reduction jobs are being handled efficiently and economically by Jeffrey shredders.

Others are crushing salt cake, pulp lap or disintegrating Kraft sheets in one operation at a great saving in time and labor.

Catalog 855-A describes various Jeffrey shredders and wood hogs for pulp and paper mills, and recommends types of equipment for each job. For a copy, write The Jeffrey Manufacturing Company, 809 North Fourth Street, Columbus 16, Ohio.

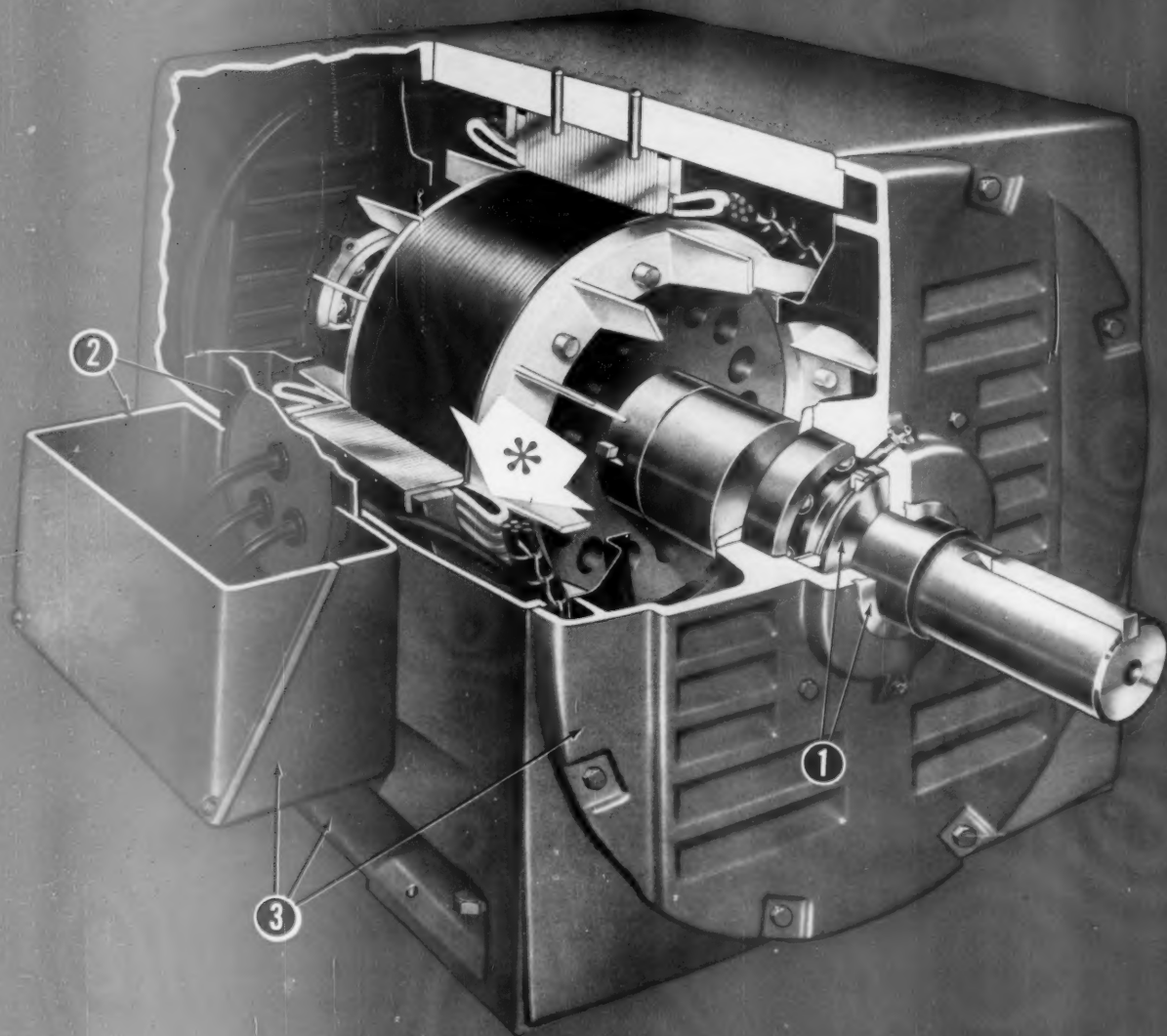
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① Water-resistant bearing seals guard Custom '8000'* motors against damage from moisture and chemicals encountered in the pulp mill, bleach plant and other stock preparation areas.

② Extra large cast-iron conduit box has gaskets at the split, and between frame and box to seal out moisture. Leads enter box through a steel plate fitted with rubber grommets to complete moisture-proofing.

③ Frame, end shields, and conduit box are cast iron. All other parts and hardware are specially treated for corrosion resistance to provide maximum reliability for pulp and paper applications.

IN ADDITION TO THE SPECIALIZED MOTOR FEATURES mentioned above, General Electric Custom '8000' motors offer these superior "standard" features: easily-removable, lightweight, flat end shields simplify motor maintenance; positive-purging lubrication system increases bearing life—prevents grease leakage along shaft

(new sleeve bearing design also available); pre-wound stator core assures uniform high performance; acoustic design reduces motor noise level.

CUSTOM '8000' MOTORS are manufactured to the rigid quality specifications General Electric has adhered to for over 80 years. However, with the implementation of advanced design and manufacturing techniques, General Electric today can accurately and economically customize motors to your specific requirements through utilization of motor components engineered exclusively for pulp and paper applications.

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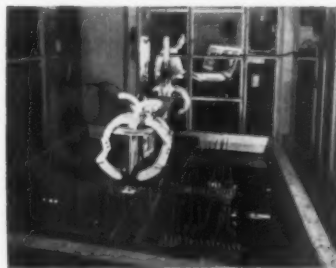
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PULP & PAPER

Pulpwood Section

Modernized Skyline May Solve Logging on Steep Slopes

• The need for logging systems combining the principles of highlead yarding and aerial transportation is increasing in the West.

As logging has progressed, the favorable topography forests have naturally been harvested first. Steep-slope areas tended to be by-passed for economic reasons or because they were "inoperable."

Now "logging operations are moving into rugged terrain as access roads probe deeper into the back country" states Robert H. Ruth, research forester, in a report issued by Pacific Northwest Forest & Range Experiment Station, Portland, Ore. "Because of this trend," he states, "it's time to look more carefully at steep slopes and decide on the best possible management practices consistent with maximum protection against erosion."

"Until recently the forest manager could avoid this decision. Road construction progressed up main drainages and into principal tributaries until steep slopes and difficult construction were encountered. At this point, operations were often shifted to another drainage where road costs were less and the timber was of better quality than the so-called inferior species growing at high elevations. This was done, despite the fact that merchantable timber on most steep slopes has long been included in management plans and allowable-cut calculations.

Situation Changed

"Economics and the steady progress of timber harvesting have changed this situation. Most of the gentle topography has now been opened up with a road system. The lower quality timber on steep slopes and the high-elevation species are becoming more valuable every year."

Road cost, the report points out, normally mounts as the slope increases. More soil must be moved, back and fill slopes longer, creek crossings are more difficult, and maintenance more costly except in rock areas, where higher construction costs are involved. Besides, the road system occupies a greater part of the logging area.

A portion of this disturbed area is permanently removed from timber production, the amount being higher on the steeper slopes. A total produc-

tion loss figure of 5%, due to roads and landings, is frequently used in management planning.

Similar problems confronted European foresters at the end of War II. Readily accessible timber had been exploited for emergency purposes and still more was needed for reconstruction. Consequently, attention was turned to stands on the upper slopes, a situation which influenced the development of a new cable-yarding technique. This involves, in one continuous operation, lateral yarding, hoisting the logs to a skyline and transporting them along the suspended cable to a landing, all in a continuous operation. Normally such systems involve lowering the logs on the skyline by gravity.

A Mile or More

Yarding distances of a mile or more are possible, thus permitting a substantial reduction in costly road construction and thereby minimizing capital expenditures. Reduced road construction means minimum soil disturbance and less land taken out of production. Also, the wide road spacing would make it easier to locate the roads away from areas of unstable soil.

This system of yarding is adaptable to a variety of cutting methods, including both selective logging and clear cutting. "There is also the possibility that, like the Europeans we can use it for thinning and shelterwood cutting, thus bringing intensive management to steep slopes," reports Mr. Ruth.

Two test operations in Washington indicate some promise. A Swiss skyline crane on the Okanogan National Forest reportedly caused only one-quarter as much soil disturbance as would a tractor-yarding operation. Road construction for the skyline operation was only 10% of that needed for tractor yarding. A recently developed modification using a radio-controlled carriage is operating on the Mount Baker National Forest.

*"It's Time To Look At Yarding Problems On Steep Slopes", by Robert H. Ruth, Research Forester, Corvallis Research Center cooperatively maintained at Corvallis, Ore. by Oregon State College School of Forestry and Pacific Northwest Forest & Range Experiment Station, U. S. Forest Service, Portland, Ore.

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Outstanding product and fine service are two major objectives of the Albany Felt Company.

Our good product you know about. Now, meet our customer contact team. Their job is service to you, enabling you to get *more tons per day . . . more days per felt.*

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31. LARRY BROWN



ALBANY FELT COMPANY

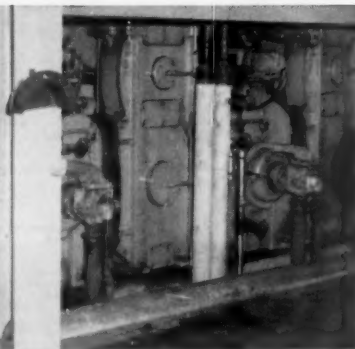
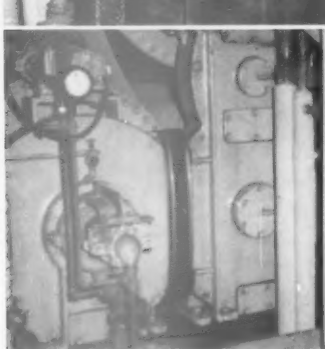
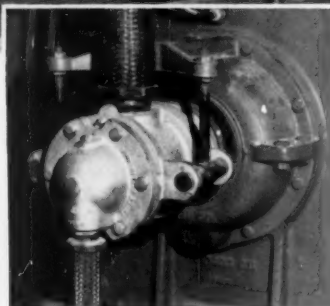
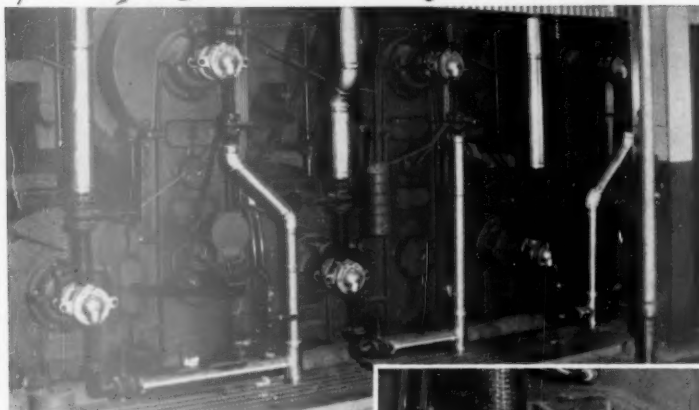
ALBANY, N. Y.

The World's Largest Manufacturer of Paper Machine Felts

For New Paper Machines... or making old ones like new!



Be sure to specify
**Johnson
Rotary Pressure
Joints**



First of all, with Johnson Joints you can expect trouble-free service and long operating life unmatched by any other method of getting steam into dryer rolls.

More importantly, Johnson Joints often hold the key to higher operating speeds and pressures, and to improved methods of roll drainage. They make possible a higher level of over-all performance and efficiency.

All machinery manufacturers can furnish Johnson Joints. There are sizes, types, mountings for all paper machines—either stationary or rotating syphon pipes—and for calenders and corrugators, too.

**Try a pair 90 days in your mill;
no obligation.
Write for information.**

*Two more with
JOHNSON JOINTS
—one new,
one rebuilt*

Here's a brand new paper machine (top) built by Beloit Iron Works, and one that's been rebuilt by Beloit. The new machine is in a midwest mill, has 61 Johnson Joints. The rebuilt is in a Pacific northwest mill, has 54 Johnson Joints. These are Type L-N Joints, for high speed machines with rotating syphon pipes; all internal parts, including syphon pipe, rotate as a unit. Other features:

SUPER CONSTRUCTION —

Rock-hard "Green Streak" seal rings, plus special process Ni-Chrome plating, slash friction and wear.

"QUICK RELEASE" NIPPLE —

Easy on, easy off.

ROD SUPPORTED —

Weight of housing, piping carried by support rods. Rotating assembly literally "floats" inside.



THE JOHNSON CORPORATION

849 WOOD STREET • THREE RIVERS, MICHIGAN

Rotary Pressure Joints • Direct Operated Solenoid Valves

Northeast

Milton Jacobs, director of Chas T. Main, Inc. was awarded an honorary degree of doctor of engineering by Norwich University. Since his graduation from the university in 1921, Dr. Jacobs has spent his career in pulp and paper. . . . William R. Willets, asst. manager of the Titanium Pigment Corp's. technical service laboratories, has been elected to the board of directors of the American Society of Testing Materials.

Philip E. Coleman has been named to newly created post of director of executive development at Scott Paper Co. . . . Forrest W. Brainerd, asst. vice pres. of Scott has been selected for another newly created post, director of planning with responsibility to lead Scott's long range planning in all areas. . . . Loren V. Forman, general manager of Scott's West Coast division moves to staff headquarters at Chester as executive asst. to the vice pres. of production, engineering and research.

Allen F. Owen, formerly vice pres. i/c research and development, Latex Fiber Industries, Inc., has joined the staff of Fiber Products Research Center, Inc. as scientific advisor; George K. Boger, Jr., formerly technical director of Amalgamated Chemical Corp., joins as manager of engineering economics; William P. Kinlin, formerly with Osmose Wood Preserving Co., joins as research associate.

Oxford's Tech Club elected new officers: Pres., Vincent A. Carpano, manager, quality control; Vice Pres., Paul A. Jones, technical service dept; Treas., Milton Weeks, engineering dept; Secretary, Charles F. Fischer, general supt. steam power, mechanical maintenance and filter plants; Program Chairman, John C. Bloom, asst. supervisor, North division uncoated mill.

Victor S. Oakes is now division mgr. of Hammermill Paper Co., Oswego division, Oswego, N.Y. James A. Gannett, resident secretary of the University of Maine Pulp and Paper Foundation, has retired. Succeeding him as resident secretary is Charles E. Crossland. . . . Robert L. Witham, plant guard, Great Northern Paper Co. had a winning paper in the 13th annual Bolton award. The subject was "Through the Grapevine."

The industry seems to have had its full share of bad luck recently with the deaths of Reuben H. Robertson of Champion and Wilbur B. Zimmerman of Howard Paper Mills. It was further saddened by the untimely death of James G. (for Good) Conley, retired general sales mgr. of Fraser Paper, Ltd. Mr. Conley was of the school that believed in fair play to all men and took particular pride in counseling young men to furthering their careers in the paper industry. There are many leaders in the industry today, who consider themselves proteges of James Good Conley.



L. W. Miller

H. W. Miller

Fraser Paper Ltd. Reports Sales, Technical Promotions

The Madawaska, Maine firm has appointed Logan W. Miller gen. sales mgr. at New York, N. Y., to succeed J. R. Cryan. He joined Fraser Paper in 1934 as an order clerk in the Chicago sales office. Prior to his present appointment, he was western sales mgr.

In another promotion, H. W. Miller becomes asst. divisional chemist at Madawaska, replacing N. L. Martin, who resigned recently.

E. Carl Snyder has been named manager of sales-service for the industrial division, Corn Products Sales Co., succeeding Thomas A. Bruce, who returns to the West Coast as asst. western regional manager of the industrial division. . . .

Top-Level Changes Reported by Penobscot Chemical Fibre



Harlow

Morrison

MacKenzie

Sleight

Abbott

Freedman

Emerson

Mooers

Leavitt

Cousins

Frank B. Harlow, mgr. of services and a 30-year veteran with Penobscot, becomes mill mgr. for the Old Town, Maine company. A chemistry graduate from Bowdoin College, he began his paper industry career in the Penobscot sulfite laboratory. Promoted to the newly created post of production mgr. was F. P. Morrison, formerly soda mill supt. Another 30-year man, he is a Univ. of Maine graduate in

chemical engineering (pulp and paper). Prior to joining Penobscot, he was a research chemist for Eastman Kodak Co. Becoming purchasing agent is Virgil MacKenzie, associated with the company since 1925 and most recently supt. of steam and power. He is also a Univ. of Maine alumnus and holds a mech. engr. degree. In other Old Town changes, Earland K. Sleight is promoted from asst. soda mill

supt. to soda mill supt.; Clarence E. Abbott, from asst. steam supt. to steam supt.; Herbert Freedman, from chemist to research director; Robert Emerson, from chemist to supt. of pulp control; H. Brian Mooers, from asst. power supt. to power supt.; Laurence Leavitt, from chemist to asst. supt. of pulp control, and John C. Cousins, from technical director to asst. production mgr.

DEPENDABLE
VALVES
for **TIGHT SEALING**
in those
TOUGH PROCESS APPLICATIONS

PENTON COATED DIAPHRAGM VALVE



This valve uses a rubber diaphragm to seal the fluid in valve body and a rubber covered disc to close the valve tight. Penton coating of body provides protection against corrosive action. Valve has high capacity—low pressure drop. Available in 1/2" to 6" sizes; manual or mechanical operators. Air diaphragm operated unit shown here. Write for Bulletin 800C.



Valve with body in wide choice of plastics. Soft rubber or elastomer plunger seals off fluid flow. Full straight-thru design, with no obstructions or reduction in cross section area when full open, minimizes pressure loss. Sizes 1" to 2". Write for Bulletin 802D

W. S. ROCKWELL CO.

2510 Elliot St., Fairfield, Conn.

PULP & PAPER

Strictly Personal



Wayne P. Harwood, Sales Engineer, Albany Felt

He will represent the Albany, N. Y. firm in eastern New York and part of Connecticut. He formerly held sales positions with Sylvania Electric Co. and Graton & Knight Co.



John F. Howell Represents Wisconsin Wire in New York

He succeeds George Clayton, who has been transferred to the Virginia-West Virginia territory by the Appleton, Wis., company. Mr. Howell is the newly appointed Wisconsin Wire salesman.



John W. MacAllister Joins United Industrial Constructors Inc.

Mr. MacAllister, as vice pres. and general mgr., has active management of UICI. He has more than 30 years of supervisory experience in construction and mechanical installation. Mr. MacAllister's experience in the paper industry includes Hamilton Paper Co., where he was project engineer for the new paper machine; Scott Paper Co.; Container Corp. of America; San-Nap-Pak Mfg. Co.; Paper Products Mfg. Co. Offices are at Amosland Road at B&O Railroad, Holmes, Pa.



Lang Smith Pavick

Hammersley Promotes Two to Board of Directors

Henry Lang and Harold A. Smith have been elected to the board of directors of Hammersley Mfg. Co., Garfield, N. J. Mr. Lang is exec. vice pres. in charge of production and has been with the firm since 1929. Mr. Smith, vice pres. in charge of manufacturing, has been on the staff since 1920.

At the same time, Hammersley honored John S. Pavick, who is celebrating his 61st year with the company. He began his career in 1899 as foreman, printing dept.

Andrew G. Elsbree, trainee at Oxford Paper Co., was recently assigned to the technical service dept. as assistant to the supervisor.

William J. Bitting is now personnel mgr., Hammermill Paper Co.'s Oswego division. . . . Hugh D. Jordan is now treas. of Brown Co. succeeding Stuart W. Skowbo, senior vice pres. and treas., who resigned to join Champion Paper & Fibre Co.—Maurice R. Castagne.

Francis M. Myers assumes duties of general supt. for Columbia Box Mill's Chat-ham, N.Y. mill. . . . George Gorman becomes asst. supt. i/c production dept. and John Fila moves up to asst. supt. i/c converting and material handling.

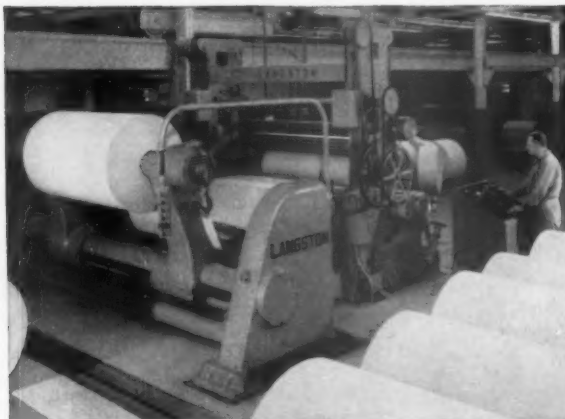
James P. Nolan, formerly training manager and asst. to the vice pres. in public relations, Oxford Paper Co., has been appointed mgr.-organization dept. for Allied Chemical's National Aniline Division. . . .

Ready for the roll. Notice the absence of a shaft. Roll is moved in between lifting arms which are then lowered and closed under pressure and then elevated to unwind position.



LANGSTON SHAFTLESS UNWIND STAND

**Boost your production . . .
reduce your slitting and rewinding costs**



Easy, fast, completely safe. One man does everything. Operating push-button controls, he closes lifting arms, elevates roll, sets brakes.

One man can load the heaviest roll. No heavy shaft to handle. No cone tightening. No couplings to engage. No crane lifting. Just pushbuttons. This is the Langston standard shaftless unwind stand for rewinding and converting applications.

You not only save time, you also get better unwinding. Roll can be positioned laterally by push-button control—even when the machine is running. It's held firmly under pressure for complete safety throughout the unwind. Several braking arrangements can be provided to handle a wide range of grades and conditions. Available extras provide for handling very narrow rolls; for constant tensioning; for automatic braking of idler rolls; for automatic web alignment and side register control; for web oscillation; and for local or remote control.

This new Langston shaftless unwind stand can be used with any make of slitter. Available for maximum roll widths from 36 to 140 in. and diameters from 14 to 84 in. For complete information, write Samuel M. Langston Co., Camden 4, N. J.



LANGSTON



Southern

Beginning to take real shape is the staff of Tennessee River Pulp & Paper Co. Named paper mill supt. is **Frank A. Jensen**, most recently with Southern Chemical Cotton Co., Chattanooga; a native of Boston, he has been associated with Camp Mfg., Franklin, Va.; Hollingsworth & Whitney, Mobile; St. Marys Kraft, St. Marys, Ga., and Hamilton Paper. **John**

Henry Morris, a veteran of service with both International Paper at Georgetown, S. C., and **Macon Kraft**, is named asst. paper mill supt. **Leon G. Smith**, who spent 14 years with Armstrong Cork at Pensacola, Fla., is purchasing, traffic mgr.

Alfred W. Jones of Sea Island, Ga., a leading figure in the industrial and recreational development of the state's coastal regions, has been named to the board of directors of Westinghouse Electric Corp.



B. Guenther, Board Mill Supt. at Marathon Southern

He was formerly paper mill supt. at Marathon (a division of American Can Co.) in Menominee, Mich. His new appointment results from the addition of No. 3 paper machine in the new board mill at Marathon Southern Corp., Naheola, Ala.

In other appointments, **John Fulkerson** becomes asst. supt. in the board mill. He was formerly asst. paper mill supt. and will be succeeded in that post by **William Woods**, shift foreman in the paper mill. Two new shift supervisors in the paper mill are **Maxwell Gunn**, No. 2 machine tender, and **Joe Marino**, No. 1 machine tender. The four new board mill shift foremen are: **Dan Rayburn**, formerly tour boss at Potlatch Forests Inc.; **Loris Crow**, tour boss for Potlatch and Gulf States Paper Corp.; **U. O'Neil**, tour boss for Dierks Paper Co., and **Neal Ford**, junior process engineer in the paper mill and converting plant at Marathon Southern.

Don Minsloff becomes coating supt. at Naheola. He was formerly paper mill technician at Menominee. Finishing supt. is **Don Hesselman**, former production services supervisor, in which position he will be succeeded by **Robert Stephenson**. New materials handling and control supervisor is **Robert Enstrom**, machine scheduler at Menominee. And **Russell Kacmarynski** transfers to the new position of supervisor, engineering planning.

... **A. M. (Buck) Fairbrother** has retired as vice pres. and mgr. of Champion Paper & Fibre Co.'s Carolina div., Canton, N. C. He is a veteran of 25 years with the company, headed the division since 1958. Named acting division mgr. was **Willis Kirkpatrick**, formerly asst. division mgr.

Cy Darcy and **A. C. (Duffy) Innes**, the only two employees of Gulf States Paper Corp. whose service goes back to the days of the old Braithwaite, La. mill (closed in 1931), have recently won promotions. Mr. Darcy becomes board mill supt. at Demopolis, Ala., and Mr. Innes tour foreman at the Demopolis board mill. Both transferred from Tuscaloosa. ... **William G. Sumner** is now sales engineer at Chattanooga, Tenn., for the Dyestuff & Chemical div., General Aniline & Film Corp.

There's more to a Lodding Doctor than meets the eye

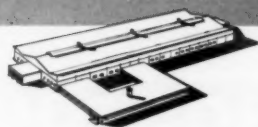
Few qualifications for manufacturing count more than experience. And when experience has been concentrated within a specialized line of endeavor it adds value to the product.

Lodding Doctors carry that extra value derived from experience — experience accumulated over thirty years of specialization in the manufacture of doctors, doctor blades, blade holders and their accessories. During this period, Lodding has built and installed doctors for every conceivable doctoring application, under all conditions and of every type and size, up to and including the Great Lakes Paper Company's 340 inch newsprint machine.

Installations of Lodding Doctors are found in nearly every paper mill in this country and in many mills abroad. Each was precision engineered and precision manufactured for the specific roll being doctoring.

Doesn't it make sense to rely on specialized experience? Most mills have found that it does. Next time, get Lodding Doctors. Then you'll profit too.

LODDING
Engineering Corporation
AUBURN, MASSACHUSETTS



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New York 7, New York

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Charles S. Conington
P. O. Box 698
Barre, Massachusetts

R. T. Barnes, Jr.
1523 Chapin Avenue
Burlingame, California

Pulp & Paper Mill Accessories Ltd.
P. O. Box 903, Station "O"
Montreal 9, Canada

E. & M. Lamort Fils
Vitry-le-Francois
(Marne) France

Joseph Winterburn Ltd.
Albert Works
Brook St.
Bury, Lancs., England

NEW

by

VALLEY

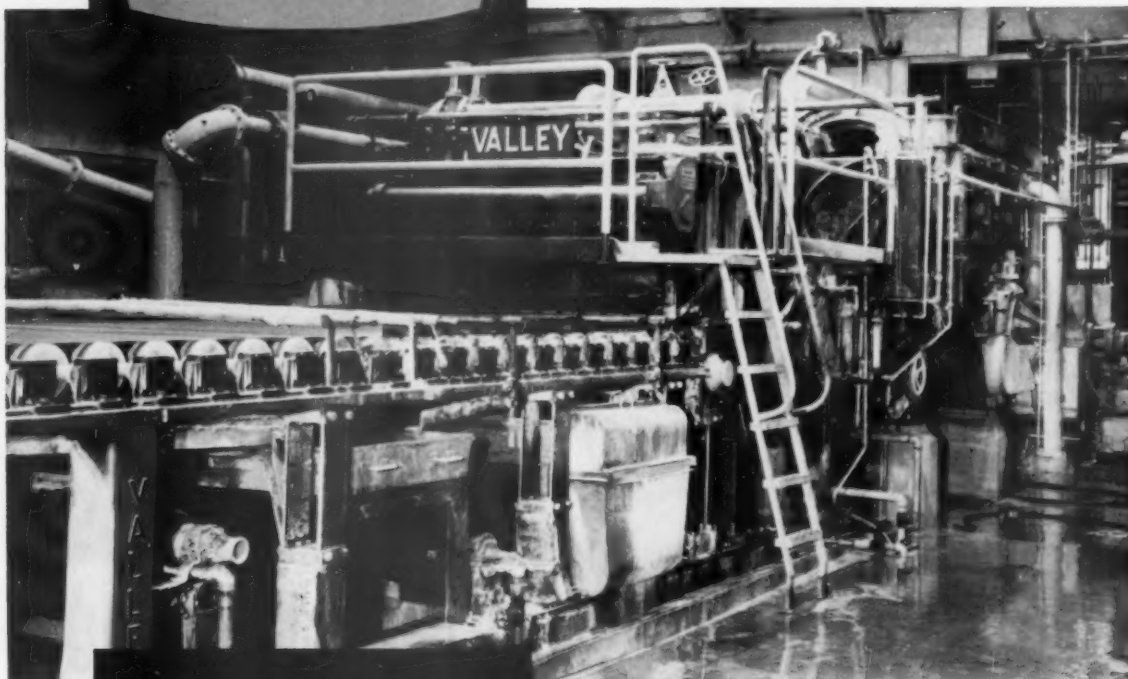
INLET-HEADBOX

and

FOURDRINIER SECTION

at D. M. BARE PAPER COMPANY

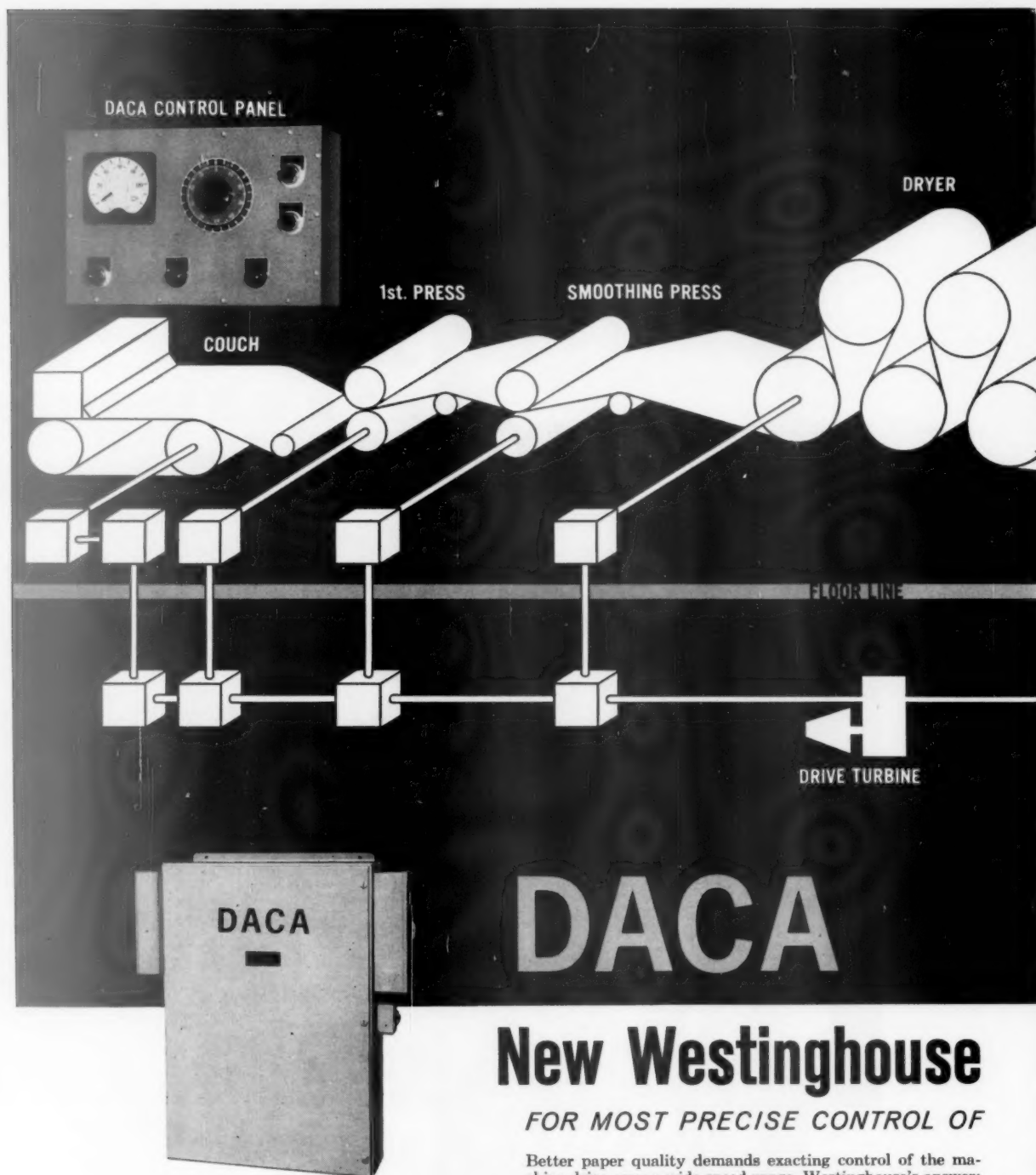
Division of Combined Locks Paper Company
at Roaring Springs, Pennsylvania



"START-UP AND OPERATION
HAVE BEEN BEYOND EX-
PECTED PERFORMANCE",
SAYS HAROLD VANDERHEI,
VICE PRESIDENT & GENERAL
MANAGER.

VALLEY IRON WORKS CORPORATION
SUBSIDIARY OF ALLIS-CHALMERS MANUFACTURING COMPANY
APPLETON, WISCONSIN

West Coast Representative: E. A. Berry, P.O. Box 958, Longview, Washington
Canadian Representative: Pulp and Paper Mill Association Ltd., P.O. Box 850,
Station "O", Montreal 9, Quebec



EXACT POWER AND PRECISE CONTROL of paper machine drives are yours with new Westinghouse DACA governor control. DACA preset control panel (top) and sensing unit (bottom) hold turbine drive (right) within the most exacting requirements of the paper industry. Control panel is usually installed at the "wet end" of the paper machine. The sensing unit may be located near the turbine, or remote.

New Westinghouse

FOR MOST PRECISE CONTROL OF

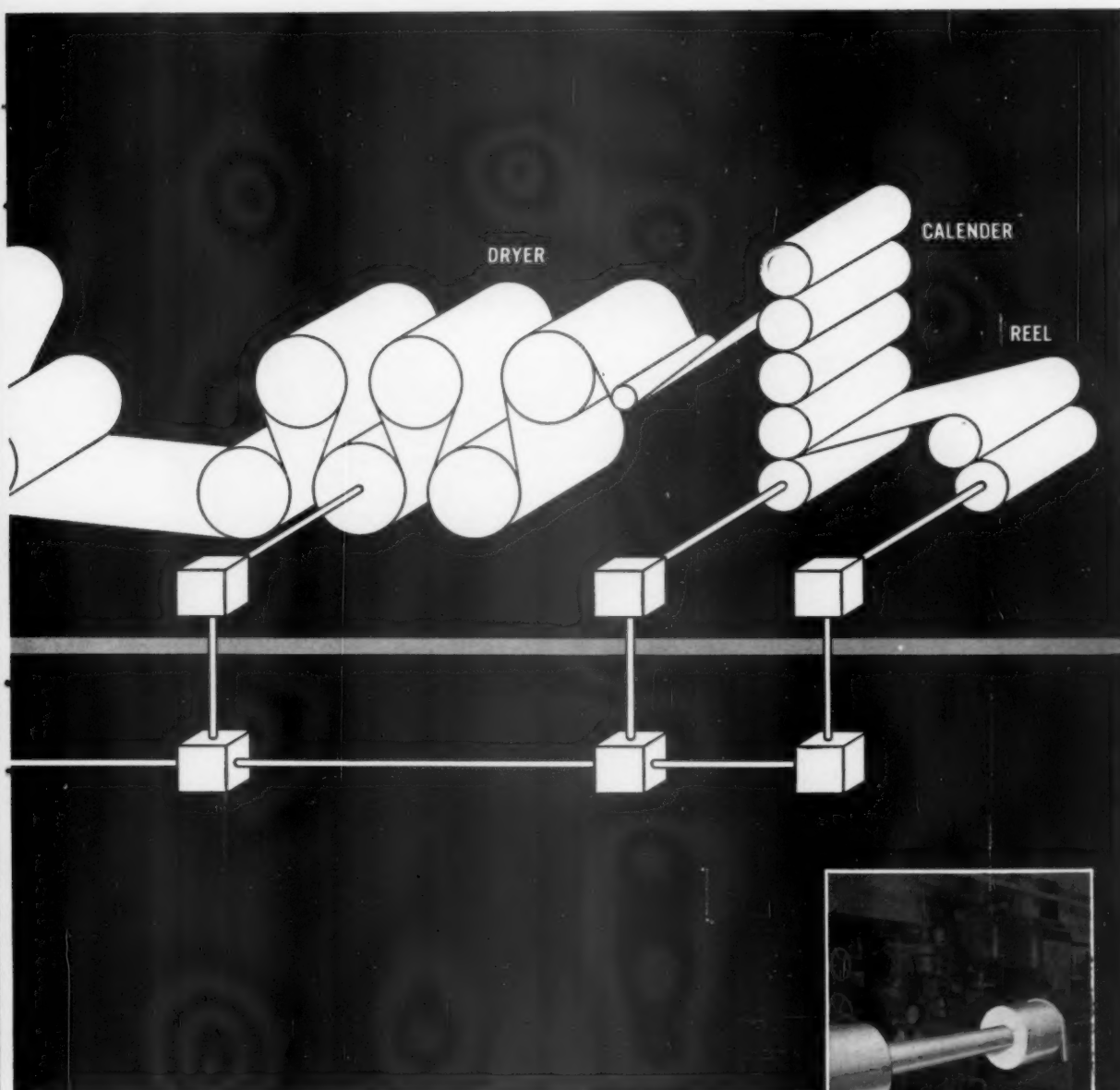
Better paper quality demands exacting control of the machine drive over a wide speed range. Westinghouse's answer: the all-new Digital Analog Control Apparatus, called DACA, an entirely different control concept!

Thoroughly tested for four years, DACA offers you these unique advantages:

Ultra-precise speed control. DACA holds turbine-powered lineshaft drives to plus or minus 1/10 of 1% of any set speed throughout a 10-to-1 speed range.

Automatic speed selection. A preset speed control device gives precise speed selection throughout the entire 10-to-1 range, as well as for "wash" and "cleanup" speeds.

Combines desirable features of digital and analog techniques without the complexity of an expensive computer.



Digital Governor Control

TURBINE-DRIVEN PAPER MACHINES

Static circuitry. No electronic tubes or electrolytic capacitors mean highest reliability as well as long life.

Eliminates down time required by the conventional-type governor to change governor gears for low-speed operation.

Installation flexibility. DACA and preset control can be installed almost anywhere. They work as well when the driving power and paper machine share the same floor as when the lineshaft drive is below the machine, as shown above.

Complete power-backup with oil relay governor and/or batteries.

THE DACA PRINCIPLE: DACA consists of a regular speed governor and servomotor, an electric-hydraulic converter, the DACA speed sensing unit, and the DACA remote preset control panel. Digital impulses from the drive

turbine feed back to the DACA sensor and are automatically compared to a reference signal. When signals do not coincide, the error signal causes the speed of the unit to be maintained within the predetermined precise limits.

DACA IS AVAILABLE NOW. For more information on how DACA can help you improve paper quality, contact your nearest Westinghouse representative, or write Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pa.

J-50615

YOU CAN BE SURE...IF IT'S **Westinghouse**



PAPER MACHINE HOSE



The Seminole Chief is washed daily with the hose that needs no care

24 hours a day...7 days a week...this U.S. Rubber Hose is used to wash down the "Seminole Chief"—the giant new paper machine in the St. Regis Paper Plant in Jacksonville, Florida. The Fourdrinier wires, for example, must never be permitted to clog up with fibre. Clogging would mean shutting down the machine for an hour or more. Constant hosing prevents this. The hose itself is roughly handled—it lies on the floor all the time, receives no care whatever. Thanks to its abrasion-resistance, flexibility and durability, U.S. Paper Machine Hose *takes care of itself*.

When you think of rubber, think of your "U.S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial rubber products.



New integral rubber nozzle on Paper Machine Hose has a built-on flange approximately 4" from the end. Flange is $\frac{1}{2}$ " wide, $\frac{3}{8}$ " high; it prevents the nozzle from lying flat where it can be damaged. Workmen like the easy grip the flange gives.



Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y.

In Canada: Dominion Rubber Company, Ltd.



Hancock

Rosenblath

New Responsibilities at International Paper Co.

Alex Hancock, with IP since 1948, has taken over as plant engineer of the Mobile Ala. mill. Stepping into his former position as asst. chief electrician at Mobile is Quinlan T. Rosenblath Jr., who has been associated with the firm since 1950.

John W. Gladstone, quality control supervisor at the Halifax Paper Co. div., Albemarle Paper Mfg. Co., Roanoke Rapids, N. C., is named technical service supt. He replaces David S. Most, who has resigned to enter private business in Boston. Sec.-treas. of the Virginia-Carolina section, TAPPI, Mr. Gladstone joined the Technical div. of Albemarle Paper in Richmond in 1954. . . . Stuart Dalheim, project leader in the Technical Service dept. of West Virginia Pulp & Paper Co., has been promoted to technical asst. in the pulp mills dept., Bleached Board div., Covington, Va.



Ivan Kuhns Joins Morden in South

Formerly senior engineer for Hammermill Paper Co., Erie, Pa., he will devote substantial time to introducing Morden pulpers throughout the southeastern area. Product line includes the new Disco-Finer, a unit designed to either defiber or refine. This high-capacity machine, says John Sigler, Morden director of sales and services, is especially well adapted to the huge southern mills. As the company's first direct representative in the South, Mr. Kuhns is making his headquarters in Atlanta, Ga.

N. Wesley Sentell is Tennessee River Pulp & Paper Co.'s recently appointed asst. wood and land mgr.

Richard Braithwaite will direct production at Hudson Pulp & Paper Corp.'s multiwall bag plant, Wellsburg, W. Va., will also serve as mgr. of Florida and Arkansas multiwall operations. . . . Robert M. Feigl has joined Union Steel Corp.'s Houston, Texas office as southwestern representative. . . . C. K. Dunlap, for many years considered "the dean of the paper converting industry", has retired as vice pres. of Sonoco Products Inc. following 44 years' service with the firm.

Also at Sonoco, James L. Dunlap, asst. to the vice pres. in charge of engineering, has been made director of engineering, a new position. . . . John G. Fleming Sr., chairman of the board and vice pres. of Fleming & Sons Inc., Dallas, Texas, died in July at 58. He was a grandson of the late John G. Fleming, who founded the company in 1893. . . . John Paul Ekberg, 76, director and retired vice pres. of Chesapeake Corp., died recently in Greenwich, Conn. . . . Charles P. Egolf is asst. mgr. of Diamond Alkali's southeastern sales office in Memphis.—William F. Diehl

C I B A



DIRECT
PURE
BLUE
P-2BR Conc.

Here is a new, effective, and economical answer to the problem of producing paper with brilliant whiteness. Direct Pure Blue P-2BR Conc. yields purer, brighter whites at savings up to 50%. This dye is meeting prescribed performance in field testing. Easy-to-work and providing ideal fastness properties, Direct Pure Blue P-2BR Conc. is well worth investigating.



Your inquiries are invited on CIBA "Paper-Proved" technical information, samples and color matching.

CIBA Company Inc.,
Paper Chemicals Department
Fair Lawn, New Jersey



Keep your
crews busy
all year 'round

with **CARBO ZINC 11*** the all-weather maintenance coating

Most maintenance paints cannot be applied below 40° F. Not so with Carbo Zinc 11... the only protective coating that can be applied outdoors in cold weather. Paint anytime, 12 months of the year, indoors or out... keeping a smaller crew busy full time. You still get protection far superior to standard maintenance paints.

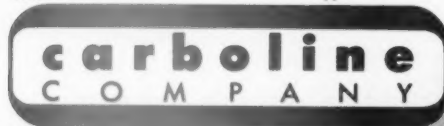
- a zinc-filled inorganic protective coating
- water insoluble 20 minutes after applying
- fast drying, long-lasting galvanic protection for steel
- apply in humidity up to 95%, temperatures from -20° F. to 150° F.
- excellent resistance to water, coastal environment, brine, humidity, solvents

Use Carbo Zinc 11 without topcoat, or as primer with vinyl, Hypalon, epoxy, or inorganic topcoat. Resists undercutting and subfilm corrosion. Low material, application and maintenance costs.

Write for information, technical data, uses and samples. Also, see our catalog in CEC, pages 911-914.

6011

*Patent applied for



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Sales engineers in principal cities.
Consult your telephone directory.

**MAINTENANCE
COATINGS
WITH EXPERIENCE**



**John E. Minch Sr. Heads
Howard Paper Mills Inc.**

He succeeds the late Wilbur B. Zimmerman as president of the Dayton, Ohio subsidiary of St. Regis Paper Co. The vacancy left by the death of Mr. Zimmerman on the Howard board of directors has been filled by the election of Arch Carswell, an exec. vice pres. of St. Regis. Mr. Minch was formerly vice pres. and director of sales for Howard. A member of the board of directors and exec. committee, he began his paper industry career in 1930 with Maxwell Paper Co., Franklin, Ohio. In 1934 he played a major role in organizing Dayton Envelope Co. and became its first plant mgr. Mr. Minch later became mgr. of Aetna Paper Co. and was named gen. sales mgr. of Howard Paper Mills when that company was formed in 1946 through merger of Maxwell Paper, Dayton Envelope, Aetna Paper and Howard Paper Co. He has been vice pres. and sales director since 1949 and will continue to headquarter at the Aetna mill in Dayton.

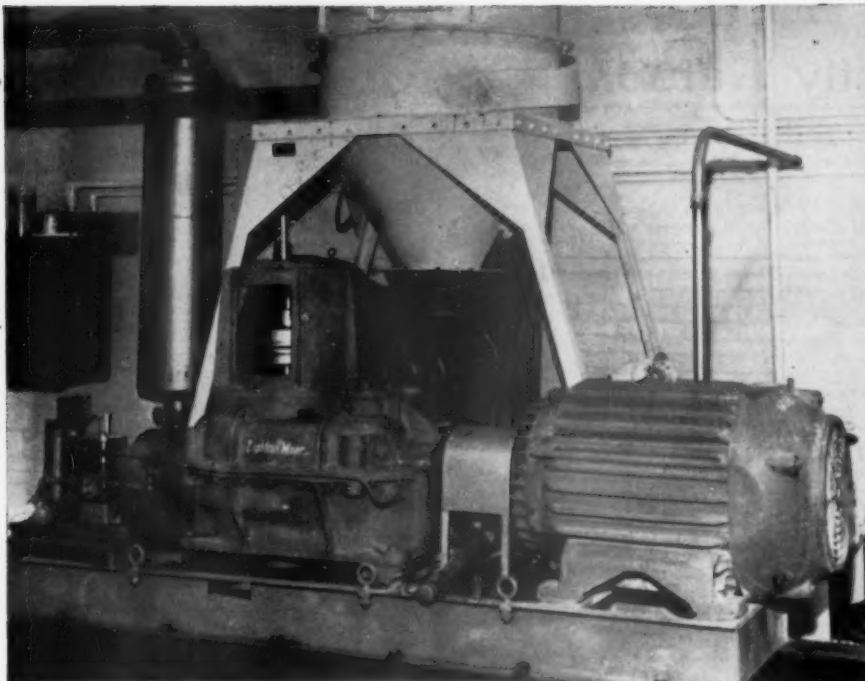
Midwest

G. E. Veneman, vice pres. and director of sales for Nekoosa-Edwards Paper Co., Port Edwards, Wis., has been elected chairman of the Sulphite Bond Group of the Writing Paper Manufacturers Assn. He replaces the late H. W. Suter Jr., vice pres. of Champion Paper & Fibre Co.

Arthur W. Miller, president of Cornell Paper Products Co. (a division of St. Regis Paper Co.), Milwaukee, died late in June. He began his business career with the firm at Cornell, Wis., 45 years ago and was to have retired July 1. . . . Three new vice presidents have been named to the Corn Refining div., Penick & Ford Ltd. Inc.: Dr. J. E. Killinger, technical sales service and field development; Dr. C. C. Kesler, research and development, and S. H. Foster, production.

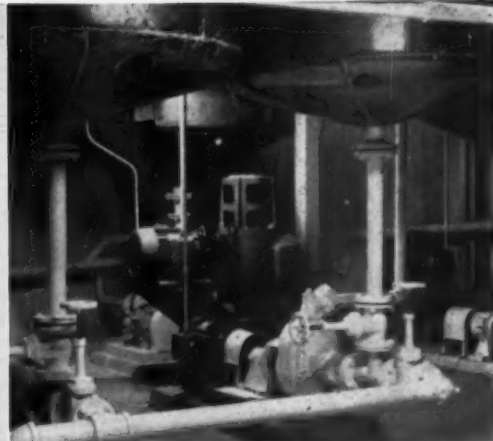
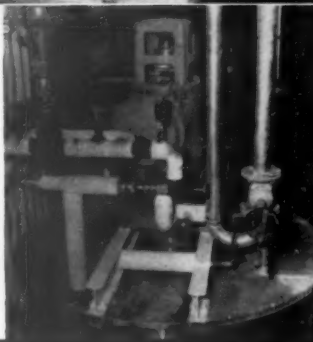
J. P. Corbin, asst. to the gen. mgr., Printing Paper div., St. Regis Paper Co., becomes res. mgr. of the Sartell, Minn. mill. He succeeds Thomas Gerace, who becomes res. mgr. of the printing paper mill in Bucksport, Maine. Mr. Corbin joined the company in 1955 as pulp development engineer at Deferiet, N. Y.

September 1960 — PULP & PAPER



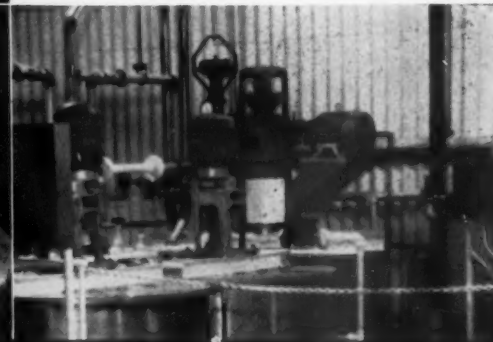
▲ **MAKEDOWN** One 75-hp LIGHTNIN Mixer slurries 50 tons of dry clay—a hopper-car load—as it feeds into dispersion tank at 12.5 tons per hour.

► **HIGHLY THIXOTROPIC** clay-starch slurry from cooker turns over in two tanks equipped with 10-hp LIGHTNIN Mixers. Then it moves to 1,000-gallon storage tanks where 5-hp LIGHTNIN Mixers keep it thoroughly blended to prevent crusting before use.



▲ **CLAY SLURRY** at 71% solids waits in five 120-ton storage tanks, held in uniform suspension by 10-hp LIGHTNIN Mixers.

▼ **STARCH MEETS WATER** in 1,000-gallon tanks. Then clay slurry is charged, reducing solids to 52-58%. A 3-hp propeller-type LIGHTNIN Mixer in each tank assures consistent density of feed to continuous cooker.



One man, 20 mixers clobber cost of coatings

Designed to handle clay in bulk as a slurry, this new mixing system at Blandin Paper Company, Grand Rapids, Minn., helps in four ways to prepare coatings at record low cost.

1. The system itself cost much less to build than comparable coating facilities.
2. It permits the purchase of lower-cost bulk clay.
3. Ended are the problems of space-wasting dry storage, handling of bags, and dust. Clay is always ready for immediate use.
4. One man per shift handles all operations—with the help of 20 LIGHTNIN Mixers ranging in size from 3 to 75 hp.

What mill management says

"We knew that mixing was going to be a vital part of our new process," says Harold F. Gismund, Blandin's

vice-president in charge of manufacturing. "We required equipment that was sound and could give us the process result we were looking for.

"LIGHTNIN Mixers have enabled us to accomplish both of our goals. The cooperation and service we have obtained from the MixCO field representative have been most helpful to us."

Since completing the new coatings plant, Blandin has decided to use LIGHTNIN Paper Stock Agitators on the mill's three brown-stock chests, a neutralization chest, and a broke chest. Guaranteed mixing performance

can mean savings for you, just as it does for Blandin. And it's easy to get. At a call from you, an experienced LIGHTNIN Mixer representative can size up your needs and help you select precisely the right mixing system to deliver the results you want.

He draws upon the experience of thousands of test runs, and successful installations in several hundred mills. He offers you widest possible choice of *standard* power-speed combinations and mixer designs. Call him in now (he's listed in Paper & Pulp Mill Catalog). Or write us direct.

Lightnin® Mixers

MIXCO fluid mixing specialists

MIXING EQUIPMENT Co., Inc., 141-7 Mt. Read Blvd., Rochester 3, N. Y.
In Canada: Greey Mixing Equipment, Ltd., 100 Miranda Ave., Toronto 19, Ont.

Strictly Personal

William H. Morris, Toledo, Ohio, sales mgr. of Owens-Illinois Glass Co.'s Multi-wall Bag div., is named vice pres. and mgr. of board sales for the O-I Mill div.

William W. Brown is named gen. mgr. of the Milwaukee plant of the Paper Products div., Owens-Illinois. He was formerly asst. regional sales mgr. in Chicago. In his new post Mr. Brown will be responsible for sales, administrative and production

activities. . . .

. . . Harlan Longnecker is named sales mgr. of the Specialties div., KVP Sutherland Paper Co., Kalamazoo, Mich.; he succeeds George Gard, who resigned recently. . . . Evans Jasper, vice pres. of Manco Mfg. Co., Bradley, Ill., becomes president of the firm; he continues to head the Manco subsidiary, Timberline Equipment Co., also located in Bradley.



John Olewine Gets New Post at Nekoosa-Edwards

He becomes asst. supt. of the Nekoosa, Wis. paper mill. Mr. Olewine has been with the firm since October 1959 as manufacturing project engineer working with managers at both the Nekoosa and Port Edwards mills. Prior to joining the Wisconsin firm, he was paper mill supt. at Luke, Md., for West Virginia Pulp & Paper Co.

William F. Thiele, mgr. of power for Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis., and president of Wisconsin River Power Co., died early in August at the age of 73. He joined CWP&P in 1920 as engineer and was the chief organizer of Thiele Kaolin Co., Sandersville, Ga., and its president since 1946. . . . Michael J. Cummins is appointed sales representative for Colton Chemical Co., a division of Air Reduction Co. His headquarters is in Cleveland, with territory embracing eastern Ohio, western Pennsylvania, western New York and West Virginia.



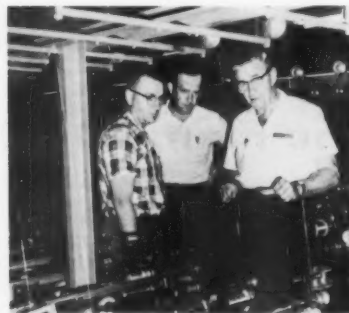
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GREENVILLE, SOUTH CAROLINA

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Schmidt Hill Jones

Wisconsin Wire Works Host for Technical Studies

First to attend the Appleton, Wis. firm's new series of cooperative technical studies on the manufacture of Fourdrinier wires was D. E. (Dave) Jones, paper supt. at the Pensacola, Fla. mill of St. Regis Paper Co. He was accompanied by Horace B. Hill Jr., WWW southern representative. Explaining some of the processes involved was James Schmidt, supervisor of the WWW drawing dept.

TEST SHEET

TEAR OFF THIS SHEET AND TEST IT FOR WET STRENGTH

SOAK IT!

THEN PUT IT THROUGH THE WET TENSILE TEST—NOTE HOW IT MAINTAINS A HIGH PERCENTAGE OF WET STRENGTH! TURN OVER TO LEARN HOW THIS SHEET GOT ITS WET STRENGTH.

CYANAMID

THIS SHEET PRODUCED BY CYANAMID'S HE* PROCESS IN CONJUNCTION WITH

MELOSTRENGTH[®] RESIN

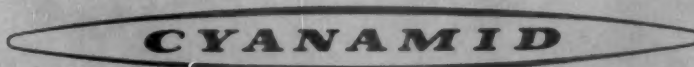
Cyanamid's exclusive HE process, using **MELOSTRENGTH** Wet-Strength Resin, provides remarkable wet-strength results. If you're **economy** minded, you would appreciate using 30% to 50% less wet-strength resin while still maintaining specifications. If you're after **greater strength**, you can achieve papers with wet-strength never before attainable, using the same amount of resin required for ordinary strength.

MELOSTRENGTH gives you: 1. **Strong paper** even when

soaked. 2. **Permanence of strength** even under storage conditions of high humidity. 3. **Good resistance** to most chemicals and acids. 4. **It is non-linting**—wipes clean without shedding.

MELOSTRENGTH Wet-Strength Resin can be applied to paper of practically every weight and grade. It is especially effective in the manufacture of grocery bags, tissues, napkins, towels, laundry tags and auto seat covers. For full information, contact us.

AMERICAN CYANAMID COMPANY / PAPER CHEMICALS DEPARTMENT / 30 ROCKEFELLER PLAZA, N. Y. 20, N. Y.



TEST SHEET

TEAR OFF THIS SHEET AND TEST IT FOR WET STRENGTH

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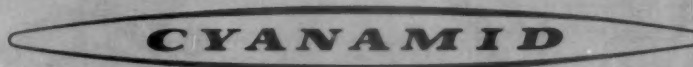
Cyanamid's exclusive HE process, using MELOSTRENGTH Wet-Strength Resin, provides remarkable wet-strength results. If you're **economy** minded, you would appreciate using 30% to 50% less wet-strength resin while still maintaining specifications. If you're after **greater strength**, you can achieve papers with wet-strength never before attainable, using the same amount of resin required for ordinary strength.

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AMERICAN CYANAMID COMPANY / PAPER CHEMICALS DEPARTMENT / 30 ROCKEFELLER PLAZA, N. Y. 20, N. Y.

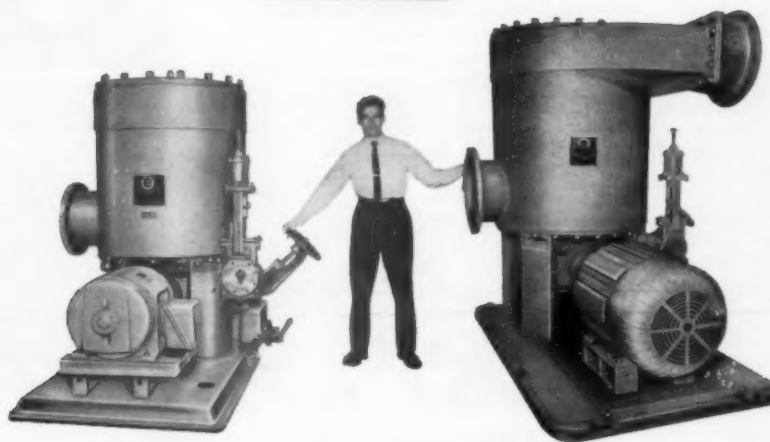
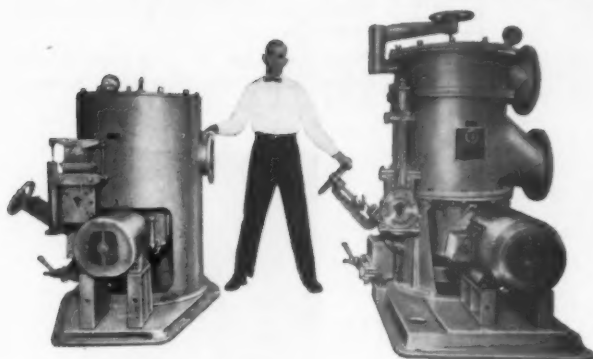


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- Model 12-P** 1200 GPM—for low tonnage Fourdriniers and individual vat application on small capacity cylinder machines
- Model 24-P** 3800 GPM—used on all paper grades—and in pulp mill hot stock refining and pressure washing systems
- Model 30-P** 5700 GPM—Intermediate size...economically suited to many pulp and paper mill conditions
- Model 36-P** 9000 GPM—Best for wide, high speed Fourdriniers and high capacity pulp mills.

All models deliver the well-known Selectifier Screen benefits
Increased Production • Improved Formation • Cleanest Sheet
Least Maintenance • Longer Felt & Wire Life

Have your Shartle Sales Engineer give you full information

The Black-Clawson Company, Shartle Division, Middletown, Ohio

**Single Source for Stock
Preparation Machines and Systems**

BLACK-CLAWSON

25 Complete Second Coating Course at WMU . . .



Both the paper industry and its suppliers were represented among the 25 recent graduates of Western Michigan Univ.'s course in "The Principles and Practice of Coated Paper Manufacture" (second session). The program at the Kalamazoo school included lectures, laboratory work and field trips.

Participants included (first row, l to r): R. P. Tidman, Scott Paper Co.; Peyton Wheeler, Minerals & Chemicals Corp. of America; William Welsh, Gulf States Paper Corp.; Ernest M. Cook, Black-Clawson Co.; Aldo Venturini, A. B. Dick Co.; Paul Hoelderle, Watervliet Paper Co., div., Hammernill Paper Co., and Edward Nissen, Union Starch & Refining Co.

(Second Row): Dr. John R. Fanselow, WMU faculty member; Eugene F. Paschall, Corn Products Co.; E. C. Garver, Armour Industrial Chemical Co.; C. Duane Coates, Mead Corp.; Edward M. Lavery, Anheuser-Busch Inc., and Howard L. Peper, Hubinger Co.

(Third Row): Milton Hurston, Kimberly-Clark Corp.; William T. Goward, Clinton Corn Processing Co.; Frederick J. Tasker, Howard Smith Paper Mills Ltd.; William Burr Jr., Dewey & Almy Chemical div., W. R. Grace & Co., and B. S. H. Hatfield, Price Bros. & Co., Ltd.

(Fourth Row): Raymond L. Janes, WMU faculty; John E. Maryanski, Corn Products Co.; William T. Craig, Canada Starch

Co. Ltd.; Dr. A. H. Nadelman, head of WMU's Dept. of Paper Technology, and Charles D. Ingram, Scott Paper Co.

(Fifth Row): William Holtzman, Glidden Co.; Gerald Chambliss, Alton Box Board Co.; Jack L. Decker, Columbia River Paper Co., and William F. Nye Jr., Hubinger Co.

(Sixth Row): Dr. R. A. Wiehm, WMU faculty, and James Gambrell, International Paper Co.



Represents Albany Felt Covering the Midwest

Thomas A. Burke has been named a sales engineer to cover parts of Michigan, Illinois and Indiana. Prior to joining the Albany, N.Y. firm, he was associated with Universal Atlas Cement Co. and Norcross Inc.



Change **COST** to **PROFIT**—

Get the Correct Carthage Wastewood Chipper for YOUR Requirements

Change disposal expense to clear profit. Convert your waste slabs, edgings and small rounds to high quality chips. There's an efficient Carthage Wastewood Chipper exactly suited to your needs.

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Please send full information on Carthage wastewood chippers.

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Carthage 39" Chipper produces maximum percentage of chips to desired length—minimum fines. Available for gravity discharge or blowing in any direction. Horizontal feed spout for easy handling of long pieces.

Here are answers to your water and waste treatment problems-

... Process and Boiler Feed Water



The **ACCELERATOR**® high rate treatment plant saves up to 80% in space. It clarifies or softens and stabilizes water in a single basin, and produces more stable effluent — a slurry contact — not a sludge blanket unit. Hot process softeners, Zeolite softeners and demineralization equipment are offered for boiler feedwater treatment. A full line of feeders, pressure filters and equipment for gravity filters including meters, rate controllers, control panels, and operating tables supplements the high rate line.

Bulletin 1825

... White Water and Waste Treatment ...

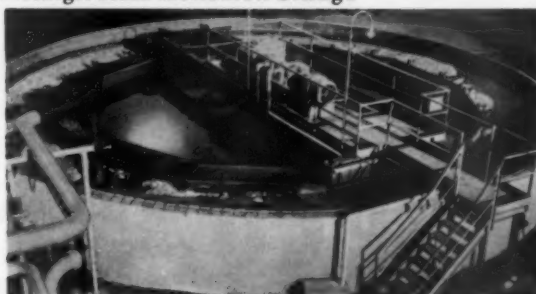


CLARIFICATION by flotation

The **SEDIFLOTOR**® clarifier is offered where space is limited and high-rate clarification is essential. This air flotation unit is ideal for removing floatable suspended solids and gives most effective fibre and heat recovery.

Bulletin 6051

... High Rate Activated Sludge



The **AERO-ACCELERATOR**® high rate activated sludge plant provides a multi-purpose unit for BOD reduction. Rapid mixing, biological oxidation and clarification under high loadings are effected within a single basin.

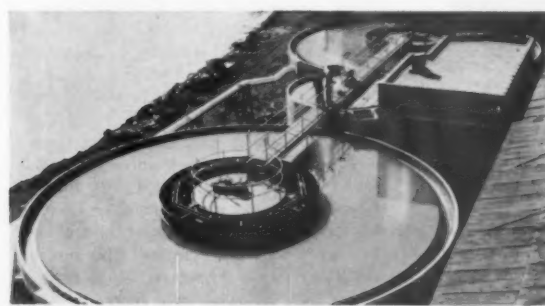
Bulletin 6510-D

... Stabilization Ponds



The **VORTAIR**® aerator is a mechanical turbine unit originally designed for oxygenating stabilization ponds and lagoons at paper mills. It provides effective aeration for activated sludge. Since this unit transfers oxygen directly from the atmosphere, it requires no compressors, yet oxygen transfer efficiency is high. It may be mounted on piers or pontoons.

Bulletin 6620



CLARIFICATION by chemical treatment and settling

The **CYCLATOR**® clarifier treats wastes containing suspended solids of very fine or colloidal nature which require chemical coagulation for adequate clarification. This unit can provide solids recovery and heat recovery by reuse of the clarified effluent. Sedimentation clarifiers with skimmers and scrapers, are part of the INFILCO line.

Bulletins W-800 and 850

These are a few of the products for water and waste treatment in the complete INFILCO line.

Write for our condensed catalog and other bulletins.



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General offices • Tucson, Arizona

Field offices throughout the United States and in other countries

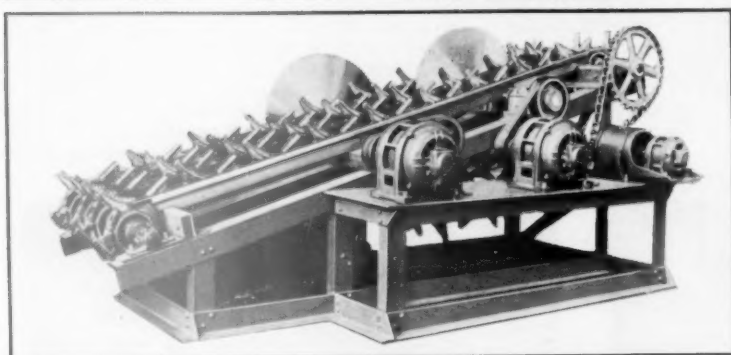
4 14-80

Bauer Promotes Six; Four New Vice Presidents Among the Recent Changes



Rastatter Irvine Goodwin Cowhey Dill Horstman

New vice presidents are: Edward L. Rastatter, sales; James E. Irvine, engineering; Ronald G. Goodwin, pulping development, and Thomas T. Cowhey, gen. mgr. of Bauer Bros. Co. (Canada) Ltd. Also, Richard R. Dill becomes mgr. of sales (industrial equipment) and Anton J. Horstman asst. to the administrative vice pres. Mr. Goodwin, in the newly created position of vice pres. in charge of pulping development for the Springfield, Ohio company, has 20 years' experience with machinery manufacturers and pulp mills. He was in the Technical Service dept. of Allied Chemical Corp.'s Solvay div. and earlier had been on the staff of the Taggart div., St. Regis Paper Co. He has been with Bauer since May 1.



MURCO PULPWOOD SLASHER

A complete piece of machinery, built, erected and match-marked in our plant for erection at the mill . . . rugged and sturdy to withstand the extremely hard usage to which a pulpwood slasher is subjected . . . quick and easy change saw arbors . . . V-Belt driven saws.

The MURCO Pulpwood Slasher can be furnished with any number of saws to cut any specified length stick of any maximum diameter . . . also complete with a log haul if required . . . chain feed drive can be furnished to incorporate a multiple speed motor so that the speed of the feed can be changed if desired.

**ENGINEERED
AND BUILT TO DO
A PARTICULAR
JOB**

WRITE FOR QUOTATIONS

Send us the following . . . length of logs to be cut . . . desired length of logs after cutting . . . maximum diameter of logs cut . . . species of wood to be cut . . . volume to be cut in cords per hour.

MURCO equipment for pulp and paper mills includes — barking drums, multiple knife pulpwood chippers, wastewood chippers, re-chippers, chipper discs, V-type spouts and chip crushers . . . stainless steel flat screens, level vibrating double deck chip screens, knot screens . . . barking drums, hydraulic wood splitter, quick opening gate valves . . . roll heading machines, pneumatic winder shafts, mechanical winder shafts, hydraulic roll lowering tables, power dam gate hoists.

D. J. MURRAY MANUFACTURING CO.
Manufacturers Since 1853 WAUSAU, WISCONSIN



Appointment of G. A. Saar as gen. mgr., mechanical depts., and of W. M. Terry Jr. as gen. mgr., electrical depts., is announced by Allis-Chalmers Mfg. Co., Milwaukee. Mr. Saar was formerly asst. gen. mgr., Industrial Equipment div., while Mr. Terry was director of engineering coordination for the Industries Group.

Dr. Norman S. Thompson, for the past seven years with Rayonier Inc. at Shelton, Wash., has been named a research associate in the Engineering & Technology section, the Institute of Paper Chemistry, Appleton, Wis. He earned his Ph.D. degree at McGill Univ., where he conducted studies at the Pulp & Paper Research Institute of Canada under the direction of Dr. C. B. Purves. At the Appleton school he will undertake research dealing largely with the mechanisms of pulping and bleaching reactions. . . . Wilbur B. Zimmerman, president of Howard Paper Mills Inc., Dayton, Ohio, drowned recently in a boating accident near Erieau, Ont.

C. D. Cooper becomes gen. traffic mgr. for Minnesota & Ontario Paper Co. He has been asst. gen. traffic mgr. since 1945 and in his new post succeeds F. E. Hufford, who retires Sept. 1. . . . Roger Geartz has been named mgr. of Continental Can Co.'s corrugated box plant in Cleveland, Ohio. He will also direct operations at the Plymouth, Mich. plant, where for the past two years he has been gen. foreman and plant supt. . . . P. C. Glotzbach, director of methods research for Montgomery Ward & Co., Chicago, is appointed internal audit mgr. for the Mead Corp., Dayton, Ohio.

Warren M. Pellot, treas. of River Raisin Paper Co., Monroe, Mich., has been elected chairman of the Financial Officers Group, National Paperboard Assn. . . .

Spencer B. Smith, previously with Rhinelander Paper Co., has joined Minerals & Chemicals Corp. of America as technical service representative.

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To meet the demand for new and different valves to control the flow of the constantly increasing number of corrosive fluids, Powell now has valves available in the largest selection of pure metals and alloys—aluminum, stainless steel, pure nickel, monel metal, hastelloy alloys, acid bronzes and many, many others.

All kinds are available—gate, globe, angle, check, “Y”, relief, flush bottom tank valves, etc. They are scientifically designed and ruggedly built for top performance when used in the service for which they are recommended. Either consult your nearby Powell Valve distributor—or write to us for illustrated literature.

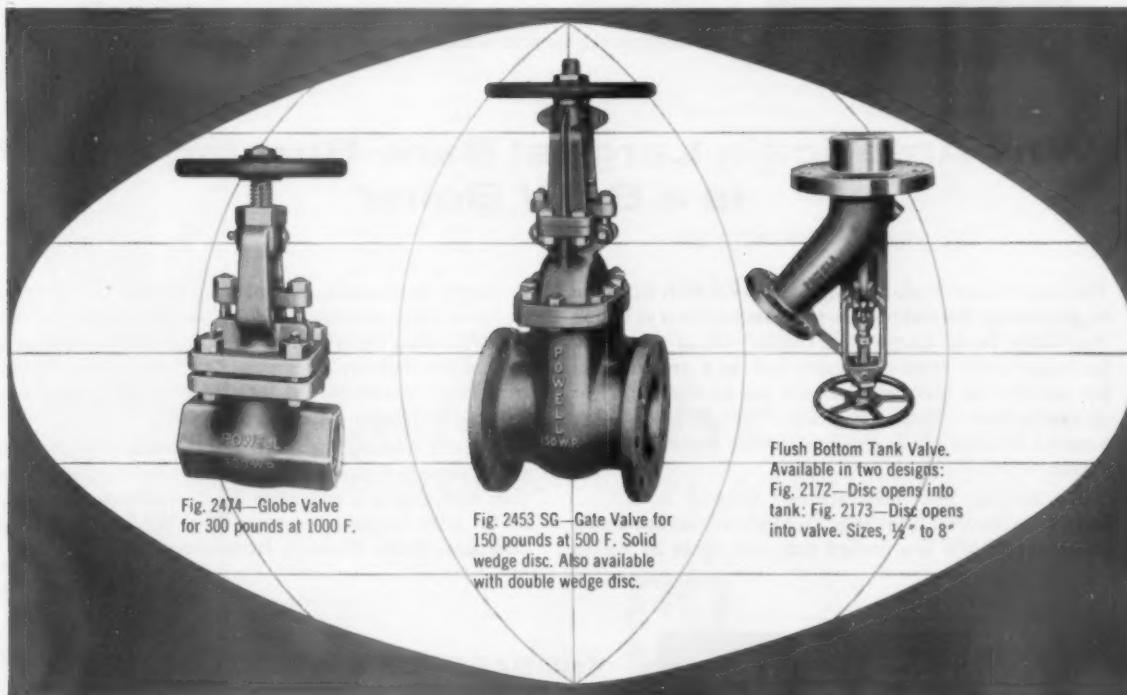


Fig. 2474—Globe Valve for 300 pounds at 1000 F.

Fig. 2453 SG—Gate Valve for 150 pounds at 500 F. Solid wedge disc. Also available with double wedge disc.

Flush Bottom Tank Valve. Available in two designs: Fig. 2172—Disc opens into tank; Fig. 2173—Disc opens into valve. Sizes, $\frac{1}{4}$ " to 8"

THE WM. POWELL COMPANY • DEPENDABLE VALVES SINCE 1846 • CINCINNATI 22, OHIO



◀ B&W Two-Drum Stirling Boiler for Union Bag-Camp Paper Corporation will burn unhogged bark, natural gas, and oil to generate steam for power and process requirements of Savannah, Georgia, Mill.

Why America's Largest Bark-Burning Boiler is a B&W Boiler

The highest rated bark-burning boiler ever built will soon be generating 550,000 pounds of steam per hour at Union Bag-Camp Paper Corporation's huge mill at Savannah, Georgia. It will burn unhogged bark as a primary fuel but can also be fired with natural gas or oil—singly or in combination with the other fuels. The unit has a design pressure of 1250 psi at the superheater outlet and will operate at 950 F.

The designer and manufacturer? Babcock & Wilcox. Long associated with burning all kinds of fuel for steam generation, B&W has proved time and again its ability

to supply dependable and efficient boilers of every size to burn every conceivable kind of fuel. And B&W's manufacturing capacity and know-how assure quick and dependable delivery schedules. That's why profit-minded steam users everywhere choose B&W to solve their fuel burning and steam generating problems.

If you're looking for ways to increase boiler efficiency and achieve fuel economies that will increase your profits, your first step is a talk with B&W. Contact your local B&W sales engineer or write The Babcock & Wilcox Company, Boiler Division, Barberton, Ohio.



P-822

B&W

THE BABCOCK & WILCOX COMPANY

BOILER DIVISION



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Information cannot be inventoried—it is too hard to keep and too perishable. Yesterday's data may be as obsolete as last year's. Still, information on supplies, on prices, and on production is management's most valued tool. For information on pulp and pulp-type products, telephone C & O. One call checks many sources. Call "C & O".

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A/S Vestfos Cellulosefabrik,
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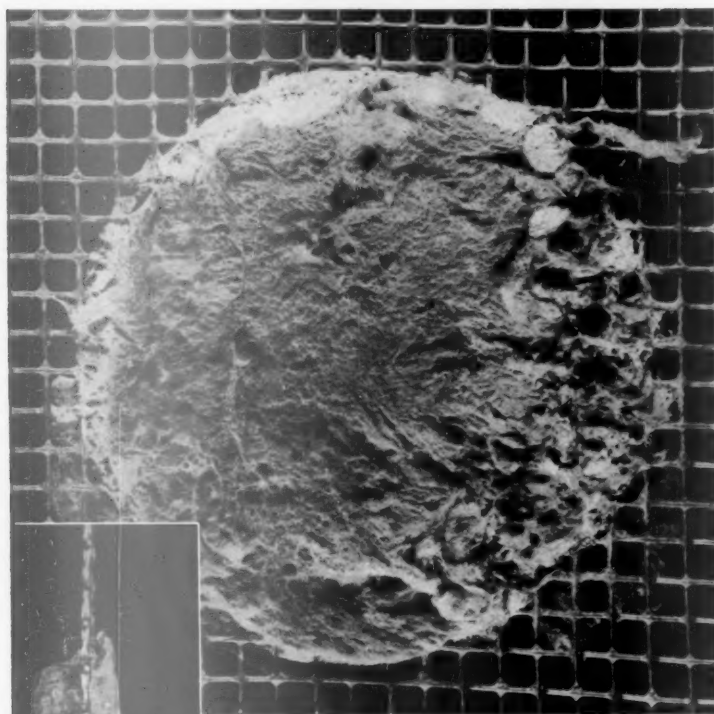
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We put a screen on the intake of a Nash Paper Mill Vacuum Pump for a few hours . . .



We were surprised, and so were the Mill Operators, at the fantastic amounts of foreign matter that will pass thru a Nash Vacuum Pump without injuring it, or in any way effecting the operation. Only a Nash Vacuum Pump can do this.

NASH ENGINEERING COMPANY

South Norwalk, Connecticut, U. S. A.

At its recent annual meeting, the Miami Valley (Ohio) div. of the Paper Industry Management Assn. elected 1960-61 officers: Chairman—Clifton Towles, Champion Paper & Fibre Co.; first vice chairman—Donald Collins, Mead Corp; second vice chairman—James Stolley, Beckett Paper Co., and sec. and treas.—James J. Johnson, Champion Paper & Fibre. Presiding was James H. Ozias Jr., retiring chairman, of Oxford Paper Co. . . . William A. Brown, treas. and controller of Orr Felt & Blanket Co., Piqua, Ohio, died recently at the age of 52.—Don W. Zeigler.

Rhinelanders Appointments

George Sutton has been named senior asst. paper mill supt. for Rhineland Paper Co., a division of St. Regis Paper Co., Rhineland, Wis. At the same time, James Dunlap became asst. paper mill supt., Richard Rasmussen personnel mgr. and Elton T. Krogel asst. pulp mill supt.

Mr. Sutton came to Ripco in 1917 as a spare hand on the machines, coming up through the ranks to the post of night paper mill supt., to which he was appointed in 1944. In 1958 he was named to a day supervisor's position on the paper machines. Prior to his present appointment, Mr. Sutton was asst. paper mill supt.

Mr. Dunlap came to Rhineland in 1955 as a project chemist, became waste control supervisor in 1958 and asst. to the paper mill supt. in 1959. . . . Mr. Rasmussen was formerly asst. to the director of industrial relations. . . . Mr. Krogel, a member of Western Michigan Univ.'s first class in Pulp & Paper Technology, began his career in the industry on the technical staff of a book paper and neutral sulfite semichemical pulp mill. He came to Rhineland in 1953 as a project chemist in the plant control laboratory, became chief chemist in 1955 and technical pulp mill supt. in 1956.

Pacific

Leslie M. Spurgeon, technical supt. of the Stockton, Cal. board mill, has been named technical director of the Paperboard div., Fibreboard Paper Products Corp. Succeeding Mr. Spurgeon is William H. Streaker, former technical supt. at the Mount Vernon board mill. A. F. Landsberg, process engineer, becomes Mount Vernon technical supt. . . . Donald C. Ellsworth, vice pres. of Columbia River Paper Mills, has been elected to the Taxation committee of the National Assn. of Manufacturers. . . . Paul R. Heitmeyer Jr. is named safety engineer at International Paper Co.'s Gardiner, Ore. plant. . . . Payson Thompson of Portland Paper Box Co., Portland, Ore., is elected a director of the Pacific Coast Paper Box Manufacturers Assn.

SCAPA

The World's Foremost and Largest
Manufacturer of
**SYNTHETIC CONTENT
DRYER FELTS**

All Scapa Long-Wearing Synthetic-Content Dryer Felts now in production are protected by *Patent Applications* in all papermaking countries of the world, and their manufacture and supply are *exclusive* to the SCAPA ORGANIZATION and its LICENSEES.

- ★ **SYNTHETIC-REINFORCED COTTON DRYER FELTS,**
with 10/12% synthetic-content
- ★ **SYNTHO-ASBESTOS DRYER FELTS,** with 20/25% synthetic-content
- ★ **DACRON-NYLON DRYER FELTS,** 100% synthetic-content

All Scapa synthetic-content dryer felts are electrostatically neutral.

- Steam Economy
- Dimensionally Stable
- Longer Life
- Lower Cost Per Ton

★ World Patents granted and pending

3

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John B. Chandler Co.

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Tipka Supply Company

415 JACKSON ST., OREGON CITY, ORE.

Strictly Personal

Victor L. Maabs, machine tender (pulp drying), is promoted to drying-finishing supt. for Scott Paper Co., Everett, Wash., to succeed Joseph G. O'Brien, who has retired after 23 years with Soundview Pulp and the Scott organization. . . . R. E. Wertheimer, asst. mgr. of container operations for Longview (Wash.) Fibre Co., transfers to San Francisco as asst. mgr. of container sales.

L. N. Goldmann is promoted from asst. sales mgr. to sales mgr., folding cartons, at the Santa Clara, Cal. plant of Container Corp. of America. . . . M. Keith Miller, chief engineer, becomes director of the Central Engineering div. of Boise Cascade Corp. to succeed W. O. Hisey, who resigned earlier this year to become international representative in London for Black-Clawson Co.

Burt R. Osterman, formerly in the traffic div. of the Southern Pacific Ry., is regional traffic mgr. for Pennsalt Chemicals Corp., Tacoma, Wash. . . . Dar G. Johnson Jr., asst. gen. sales mgr. for Electric Steel Foundry Co., Portland, has been elected national vice pres. of the Assn. of Industrial Advertisers.



Dr. W. W. Moyer Resigns

. . . as director of research at the Central Research div. of Crown Zellerbach Corp., Camas, Wash. The recognized authority in industrial carbohydrate chemistry holds a Ph.D. in organic chemistry from the Univ. of Illinois. He later did graduate work at both Harvard Univ. and the Univ. of Munich. Prior to joining Crown Zellerbach in 1947, Dr. Moyer was research project leader for Allied Chemical & Dye Corp. and director of research for A. E. Staley Mfg. Co. He listed personal reasons for his action.



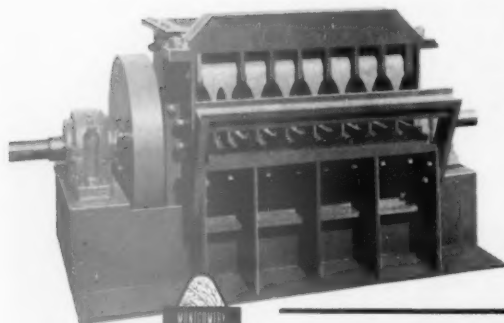
Hearon Barton Nunn

Promotions at CZ

In major realignment of Crown Zellerbach corporate research functions Dr. W. M. Hearon is appointed vice pres. for research and development. Formerly mgr. of Crown Z's Chemical Products Div., Camas, Wash., he moves to San Francisco headquarters in this newly created position but will continue to retain operational responsibilities of Chem. Prods. Div. Dr. J. S. Barton, director of packaging research & development for Crown's Western-Waxide Div., San Leandro, Calif., becomes director of research, Central Research Div., Camas, as successor to Dr. W. W. Moyer. E. H. Nunn, who was res. mgr. of CZ's Carthage, N.Y. and St. Francisville, La. plants prior to joining CRD, becomes asst. gen. mgr. of Chem. Prods. Div. Dr. Barton is succeeded by Dr. E. G. Tomm who has been asst. dir. of packaging research & development of Western-Waxide.

JACKSONVILLE BLOW PIPE COMPANY announces the NEW K-C Model of the marvelous MONTGOMERY BLO-HOG (pat. pending)

ESPECIALLY DESIGNED FOR PAPER MILL SERVICE



- Minimum of down time and maintenance.
- Punch and die action.
- Tramp steel protection with replaceable shear pins on outside of machine.
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- Interchangeable teeth.
- Replaceable anvil tips.
- Replaceable abrasion resistant steel wear plates
- Hard surfaced teeth and anvils.
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- Capacities allow for 250% surges.

OTHER MODELS ARE AVAILABLE FOR RE-CHIPPING AND BULL SCREEN REJECTS

All Montgomery products are guaranteed to do the job they are sold to do.

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QUALITY THROUGH EXPERIENCE • SINCE 1925 • SOLVING DIFFICULT PROBLEMS FOR INDUSTRY

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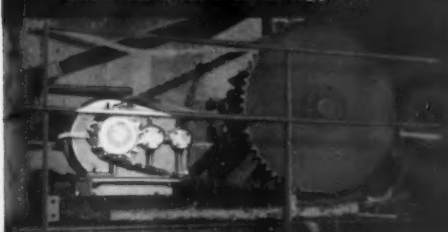
...quality costs you less!

For more than 70 years, Western Gear's name on gear drives has been a standard of quality in forest products industry installations. Western Gear speed reducers and gear drives have become standard equipment in the lumber and pulp and paper mills of the West, and more Western Gear drives are in use in these mills than all other makes combined. ■ Users know why Western Gear forest products industry drives are favored. First, Western Gear's intimate knowledge of the industry enables them to engineer and manufacture to customers' exact needs. Secondly, Western Gear's high standards of quality guarantee rugged, reliable, trouble-free performance. And thirdly, Western Gear's years-ahead engineering anticipates user requirements...and usually gets there first with the answer. ■ Western Gear's experience in electro-mechanics and infinitely variable speed power transmission can solve your drive problems.

For information, write, wire or phone collect to: **WESTERN GEAR CORPORATION**
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Western Gear speed reducer driving jack ladder



Western Gear side entering drive to screen chest



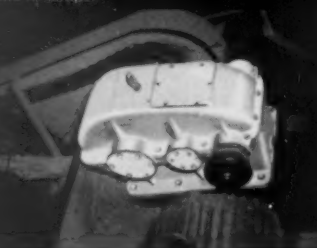
Western Gear unit power conveyor carrying chips to digestors



Western Gear speed reducer powering conveyor carrying chips to silo



Western Gear unit powering conveyor to two strand scraper



Western Gear vertical drives on stock blending chest



By every standard... **WEST END** MEASURES UP AS
THE QUALIFIED SUPPLIER OF SALT CAKE

• ACCURATE
PROCESSING
OF ORDERS

• UNIFORMLY
HIGH QUALITY

• ABUNDANT
STORAGE

• FLEXIBLE AND
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LOADING AND
SHIPPING

• EXTENSIVE
PRODUCTION
CAPACITY

• VAST NATURAL
SOURCE OF
RAW MATERIAL

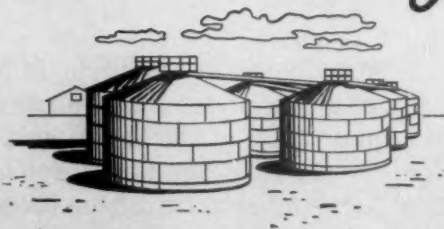
• ALL COMMIT-
MENTS SCRUP-
ULOUSLY MET

• FRIENDLY, HELP-
FUL ATTENTION
TO INDIVIDUAL
NEEDS

• PROMPT,
AUTHORITATIVE
ANSWER TO
EVERY INQUIRY

However you view
your needs, you will
find in West End a
unique coordination of
specialized services,
extensive production
facilities and product
excellence essential
to the prompt, effi-
cient handling of indi-
vidual requirements.

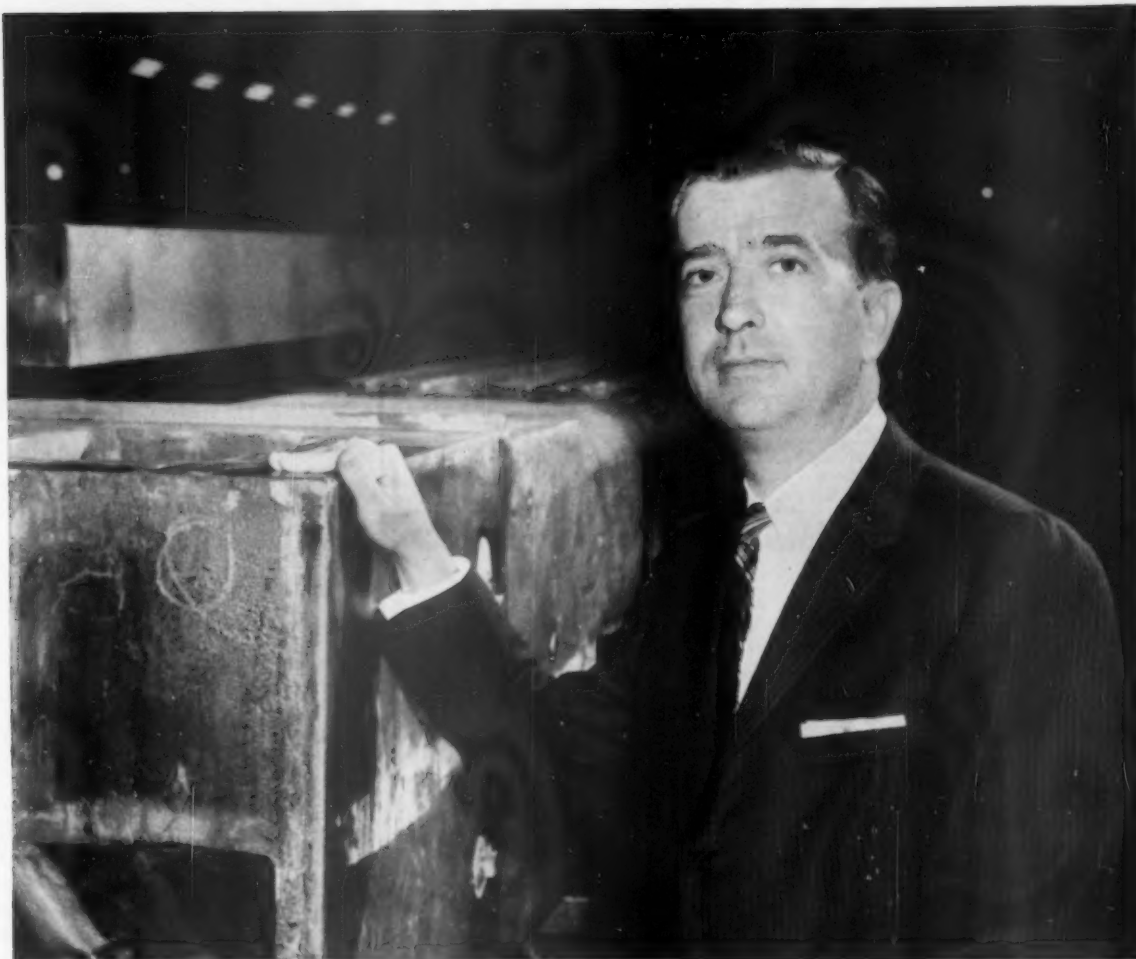
Abundant storage



Vast reserves of finished products stored in exten-
sive tank facilities are immediately available to
meet any regular or emergency requirement
promptly and easily regardless of market con-
ditions. As West End increases production to
serve an ever-expanding market for its prod-
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enlarged to maintain the abundant level
of chemicals in reserve.



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The day-to-day operation of a modern plant is an exacting job, one that requires men with diverse skills and wide experience. John Walsh, vice president and general plant manager of Beloit Eastern Corporation, is such a man. Well versed in all facets of plant management, he is in a position to see that each job receives the individual attention necessary to building the finest and most efficient of mill equipment. Your Beloit Eastern products have that "something extra" because John and his staff of experts are on the job. Look to Beloit Eastern to furnish you with the finest in finished product processing equipment.

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Unwind Stands and Tru-Tension
Controls • and other equipment for
the paper and allied industries.



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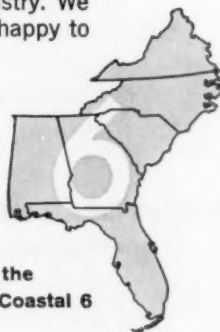


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ACL WOOD
CHIP CARS**

**TO SERVE THE
PULP & PAPER INDUSTRY**

Because of your overwhelming acceptance of our first 200-car fleet of jumbo-size 70-ton wood chip cars, Coast Line is building 200 more to serve you. These cars represent just one more of the many ways Coast Line works to meet the individual shipping needs of our friends and customers in the pulp and paper industry. We appreciate your patronage and will be happy to work with you at any time to help you solve your particular shipping problems. Why not give us a call.

"Thanks for Using Coast Line"



**...serving the
Southeast Coastal 6**



**W. P. Dapses Represents
Lodging on West Coast**

For the past 14 years sales development engineer for Wolverine Equipment Co., he is named exclusive sales representative for Lodging Engineering Corp. in Washington, Oregon, California and Alaska. He makes his headquarters in Seattle.



**Lee H. Flanders, California
Rep., Bolton-Emerson**

Following graduation from Temple Univ., he was for three years associated with the technical dept. of Hudson Pulp & Paper Corp. Mr. Flanders was later associated with U.S. Steel and Cities Service prior to joining John W. Bolton & Sons Inc. to represent both the parent firm and its Emerson Mfg. Co. div. He lives in Oakland.

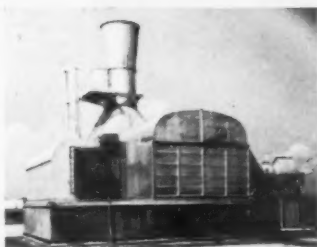


**Chester H. Pedersen, Sales
Mgr., ESCO Seattle**

He has been a member of Electric Steel Foundry's Co.'s sales staff nine years and has been associated with Pacific Northwest mills in the increasing application of high-alloy metals.



SF Newsletter



SF HEAT RECOVERY UNITS SAVE BTU'S and DOLLARS

SF Heat Recovery Units offer tremendous savings in many areas of a mill operation. Savings are so great in fact, that people in mills which have had these units installed have been rumored to call them "money machines."

One thing that the SF Heat Recovery Units do is to utilize heat from various drying processes which would otherwise be lost through the exhaust system. This, of course, means that your heat supply and power costs go down.

And, the recovered heat can be used to pre-heat make-up air for the dryer, for ventilation purposes or to pre-heat water if desired.

Building maintenance can be cut down, too. With the help of an SF Heat Recovery Unit, walls and roof can be kept dry all year round, so moisture damage and building rot can be things of the past.

Call or write today, and let one of SF's engineers show you how an SF "money machine" can cut down your operating costs and increase your profits.



THERE'S A CERTAIN AIR ABOUT AMERICAN SF PRODUCTS

Perhaps the greatest project we've ever done was to design and install the ventilation and air circulation system in Sweden's vast underground military and naval installations, and in an entire underground aircraft factory which is part of these installations.

The complex requirements of the aircraft plant called for a system which would maintain livable temperatures in the many different sections despite widely varying conditions; circulate inside air as well as provide fresh surface air, and cool, dry or heat it as conditions dictate; operate, even under an enemy gas attack!

To meet the first challenge, the unit was divided into twenty subsections, each of which controls temperatures so that variance in any one section is only about 1° C and relative humidity is kept at 30-40%. Fans, condensers and evaporators, etc. take care of circulating, cooling, drying and heating inside air, and in addition, the system can draw up to 4274 cu. ft. per person per hour of fresh outside air. In the event of a gas attack, the system takes in only sufficient outside air to compensate for oxygen consumed, and this air is purified by gas filters at the point of admission.



AIRBORNE PULP DRYING with the SF FLAKT DRYER, TYPE L

A hot air pulp dryer that conveys your pulp sheet FLOATING ON A BED OF AIR! That's the SF Flakt Dryer, Type L with its Airborne Web feature.

The sheet enters the dryer at the highest pass directly from the wet section. There, it floats between hot air streams which are directed so that they carry the sheet to a turning roll at the opposite end. Then, the air streams forward the sheet on its driving course through the next lower pass.

Greater capacities, higher drying rates, smaller dryer dimensions and reduced building costs all result from the high efficiency impingement which is part of the SF Flakt Dryer.

Your pulp gets the gentlest possible handling because the sheet never comes in contact with hot surfaces. And, since there are no mechanical conveyors to grease or repair, there are no costly shut downs! Still another feature is automatic threading to complement the Flakt Dryer's higher speeds.

Write today for full information.

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.....
SF Products Canada Ltd., ★ 940 Cote de Liesse Road, Montreal

Strictly Personal

Robert O. Lee, director of public relations and advertising for Georgia-Pacific Corp., Portland, Ore., and wife Nancy plan a flying trip to India in March 1961. Goal: a mountaineering expedition in the Himalayas, which will include climbing 28,146-ft. Mount Kanchenjunga and 24,000-ft. Mount Talung.

Mervin L. Munson, personnel mgr. for Simpson Logging Co., Shelton, Wash., transfers to Simpson Timber Co., Seattle, as industrial relations director. . . . Hills-McCanna Co. names **R. D. Brown** veteran regional mgr., with offices at 110 S. Euclid, Pasadena, Cal., and **William Loomis** sales engineer at San Leandro. . . . **James Collier**, high school senior and son of Sidney M. Collier, vice pres. and gen. mgr., Spaulding Pulp & Paper Co. in Newburg, Ore., is spending the summer in the Netherlands as an American Field Service student. . . .

W. S. Fisher, president and gen. mgr. of Accurate Corrugated Specialty Corp. and Arrow Board Corp., Los Angeles subsidiaries of Southwest Forest Industries Inc., has been named to head the newly created Container div. of the parent firm. Division headquarters will be in Los Angeles, while executive offices of Southwest

Forest Industries continue in Phoenix, Ariz. At the same time, Mr. Fisher announced that Accurate and Arrow are to be combined with the Southwest corrugating plant in Glendale, Ariz. **John D. Cox**, head of the Glendale plant, will be in charge of sales for all plants in the new Container div. . . . **Stewart S. Hawes**, president Blyth & Co. Inc., New York, N. Y., and **Robert E. Flowerree Jr.**, president of Georgia-Pacific Paper Co., Portland, Ore., have been elected directors of Georgia-Pacific Corp.

The Western Operations dept. of Borden Chemical Co., a division of Borden Co., announces the following appointments: **John W. Runkel**, at one time with Oregon Forest Products Laboratory and formerly plywood sales mgr., is district mgr. and will be responsible for sales and manufacture in Oregon, southern Idaho and Wyoming; **Benjamin B. Butler** is to be district mgr. responsible for sales and manufacturing in the California region and will also coordinate activities of the West Coast Engineering dept.; **Francis W. Linehan** is district mgr. for sales and manufacture in Washington and Canada, following service as sales mgr. for western operations.—Louis H. Blackerby



Hobe L. Swan Promoted At Scott's W. Coast Div.

He was formerly mgr. of the packaging section in Scott's Procurement div. at Chester, Pa., and in his new post succeeds **J. Howard Schneider** as procurement mgr. at Everett, Wash. Mr. Schneider becomes plant mgr. of Coos Bay Pulp Corp. operations in Empire.



Simmons



Miles

William Powell Co. Names Two to West Coast

The Cincinnati valve firm names **William P. Simmons** as San Francisco regional sales engineer and **Robert A. Miles** as Los Angeles district sales representative.

E. W. Carey Elected President, Fibreboard Paper Products Corp.

He succeeds **William L. Keady** as head of the San Francisco firm. Mr. Keady announced his resignation effective August 26 but continues as a director and is in charge of foreign operations. Mr. Carey, who joined United States Gypsum Co. in 1929 and was vice pres. for personnel and organization when he left in 1951, affiliated with Fibreboard in 1957. Last year he was named a director and vice pres., marketing.

Joins Georgia-Pacific

Frank X. Kreiling, formerly paper mill supt., Thilmany Pulp & Paper Co., Kaukauna, Wis., joins Georgia-Pacific Paper Co. as production mgr. of firm's modern, recently expanded 650 tpd plant at Toledo, Ore.

Don't take chances on couplings



CHECK PUBLISHED MISALIGNMENT RATINGS BEFORE YOU BUY

Since misalignment is the basic problem that shaft couplings are designed to solve you'll find a published conservative misalignment rating (along with load capacity rating) for every Fast's Coupling. Compare it with the misalignment rating of any other coupling you are considering. One further advantage of Fast's Couplings' misalign-

ment ratings: You save money on installation because, knowing the ratings, you don't have to line up driving and driven elements with pinpoint accuracy. It's one more important reason why Fast's Couplings are the choice of more equipment manufacturers than any other gear-type coupling. **KOPPERS COMPANY, INC.**, 1309 Scott Street, Baltimore 3, Md.



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Routing clays the Huber way is fastest

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All hopper cars and boxcars for Huber shipments are carefully inspected and cleaned, and all boxcars are paper lined prior to loading. Square, solid unit and palletized loads are rapidly handled and easily stored. Huber shipments arrive in top condition.

Ask for working samples of any of the clays in the complete Huber line.



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WONDERWHITE: FOR THE BEST IN BRIGHTNESS AND FORMATION

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WONDERWHITE

You probably have heard paper manufacturers commenting on how WONDERWHITE achieves "high brightness without loss of opacity." But did you know that you also get this brightness in a fiber with unexcelled paper-making qualities?

Paper makers have always known that Northeastern Spruce has unexcelled paper making properties. Now, with WONDERWHITE, you have the forming and printing qualities available only in a spruce sulphite, plus the high brightness which only Chlorine Dioxide can give.

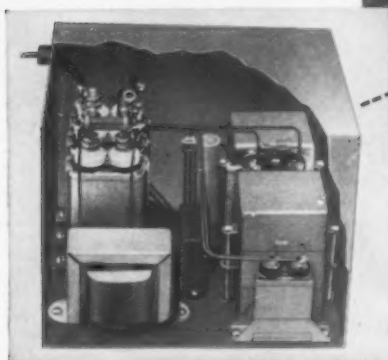
Maybe this pulp is the answer to a number of your problems. May we suggest a trial shipment? You'll soon see why we called it WONDERWHITE.

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THE WESTERN PRECIPITATION
"Transistomatic"
CONTROL



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the
Industry's
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NO TUBES! NO RELAYS! NO COUNTERS!

and carries a Lifetime Guarantee!

In the electrostatic precipitation of dust, fume and fly ash, no installation is completely modern without automatic control to maintain optimum Precipitator efficiency as the characteristics of the gas stream fluctuate. Compared with manual control, automatic control is not only more sensitive and more efficient, but actually costs less because of the vital savings it makes in labor and operating costs... *savings so important that no profit-minded operator will want to be without them.*

But the important point to remember is this—

Although many manufacturers of precipitation equipment offer units for precipitator automation, no other unit is equal to the "Transistomatic" Control for foolproof simplicity, rugged dependability or control accuracy!

These are not idle claims. They can be easily verified by making your own comparison...

Compare **ACCURACY!** The "Transistomatic" does not base its "sensing" action on spark frequency alone—or spark intensity alone. Instead, it continuously integrates BOTH frequency and intensity to establish an overall "power value" that provides a new standard of control accuracy!

Compare **DEPENDABILITY!** The "Transistomatic" unit contains no parts of any kind requiring regular replacement. Moreover, the entire unit is completely sealed—moisture-proof and watertight.

Compare **GUARANTEES!** The "Transistomatic" is so foolproof and trouble-free it carries a lifetime guarantee!

BEFORE YOU BUY ANY automatic precipitation control, be sure to get the complete "Transistomatic" story. See your nearest Western Precipitation representative for full details... or write, wire or phone for this "Transistomatic" booklet!



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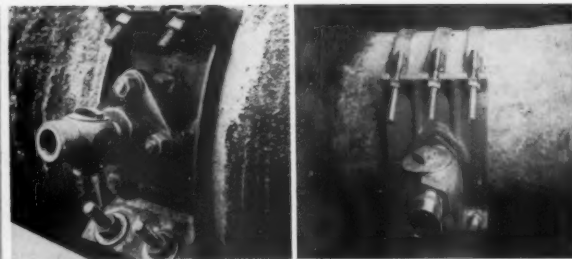
Tapping Water Lines Under Pressure

*American Concrete
Cylinder Pipe
can be tapped with ease
and economy while still
under pressure.*



The sudden explosive growth of many communities in the west has made it difficult for the best of advance planners to achieve both economy and adequate service in water supply systems designed for the future.

The possibility of unpredictable requirements for service outlets was one of the factors taken into consideration in the design of American Concrete Cylinder Pipe. Without de-watering the pipeline, small or large diameter outlets can be easily installed by any water works service group using standard tapping equipment. New outlying areas which mushroom in the typical western growth pattern can be readily integrated into a planned system if American Concrete Cylinder Pipe is used for the transmission lines.



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**full chip flow control
without a "bind" in a binful**

REX Rotary Table Feeders

Efficiently and economically, Rex Rotary Table Feeders give you positive control over hard-to-feed chips.

Binding, flooding, and starving are eliminated—whether you feed continuously or periodically—for Rex Feeders are completely adjustable for precise trouble-free volume control.

CUTS COSTS MANY WAYS

Rex Rotary Table Feeders are cutting costs in many mills across the country. They combine low capital investment, operating and maintenance costs with top feeding efficiency.

Rex leadership in design and manufacturing is your assurance of quality. Heavy-duty rollers mounted on Shafer-Rex Self-Aligning Roller Bearings; precision-machined table track and ring gear, are but a few of the **QUALITY** components in Rex Rotary Table Feeders.

A MODEL FOR EVERY SYSTEM

Three standard types are available in a variety of sizes for maximum efficiency in every application. Standard models install quickly and easily on existing bins.

FREE BULLETIN Number 6093 gives you full information. Write CHAIN Belt Company, 4691 W. Greenfield Ave., Milwaukee 1, Wis. In Canada: CHAIN Belt (Canada) Ltd., 1181 Sheppard Ave. East, Toronto.

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CHAIN BELT COMPANY

REX IS BEST...IN THE USER TEST

Crown Zellerbach Appointments

Crown Zellerbach Corp., headquartered at San Francisco, reports the following staff changes in various areas of operations:

Dan Ashton, technical supervisor at the St. Helens (Ore.) div., transfers in grade to St. Francisville (La.) Paper Co. as successor to Robert Plankington, who becomes coating development chemist at the West Linn (Ore.) div. . . . Eddie London is named purchasing supervisor at the Los Angeles mill. . . . Richard Carter transfers from West Linn to the Camas (Wash.) div. as industrial engineer, and James Stoll, former senior industrial engi-

neer at Camas, succeeds him as divisional industrial engineer at West Linn.

Also at West Linn, Robert Gaiser is promoted from coating development chemist and group leader to asst. technical supervisor. . . . Robert Nite becomes supt. of the Multiwall and Grocery Bag dept. at Port Townsend, Wash., succeeding Bill Gianotti, who transfers to Camas as gen. supt. of the woodmill, finishing and services. . . . Donald Moritz, West Linn machine room shift foreman, transfers to Port Angeles, Wash., as paper mill supt. . . . Edwin Frazer, divisional industrial engineer, is named technical asst. to the Camas paper mill supt.

Paul F. Evans, district mgr. for Ameri-

can Forest Products Industries Inc. at Tacoma, Wash., joins Crown Zellerbach's Public Relations dept. in San Francisco as publications editor. . . . William Cyrus, asst. technical supervisor of the West Linn div., is named technical director at St. Helens.

Pulpwood

The Northern Woodlands dept. of International Paper Co. announces the following personnel changes: George M. Blaisdell, resident mgr. of Maine woodlands and mgr. of the wholly owned subsidiary, International Logging Corp., is retiring following more than 30 years of company service. Succeeding Mr. Blaisdell in both posts is Morris R. Wing, former asst. resident mgr. And George M. Blaisdell Jr. is named gen. supt. of International Logging. . . . Thomas B. Glazebrook, former head of timber management appraisal, is promoted to asst. chief, Regional Timber Management div., United States Forest Service, Portland, Ore.

Sandy McArthur Retires as Rayonier Woods Chief; Ernie Davis Takes Over



One of the South's most widely known woodlands managers, Rayonier's A. G. (Sandy) McArthur, left, has retired as Southeast Timber div. manager. He will remain available to Rayonier as a timber consultant. Ernest P. Davis, right, who has been operating manager of the division, succeeds him. Mr. McArthur joined Rayonier in 1937, is now chairman and president of Southern Industrial Bank of Jacksonville, v.p. of Turpentine and Rosin Factors, Inc., chairman of the Southern Standard Life Insurance Co. as well as dir. and chairman of several other enterprises. He is also a former state senator of Florida. Here the outgoing and incoming managers are shown planting Rayonier's 100,000,000th pine seedling in the Southeast. Both Mr. McArthur and Mr. Davis have played important roles in the development of land in the Southeast.



The user-benefits this Orr felt is providing at The Mead Corporation's board mill in Cincinnati are typical of Orr felts everywhere.

Custom engineered to your exact specifications, these quality felts assure good finish and long life on the machine, greatly reducing downtime and maintenance costs. That's why so many papermakers specify Orr.

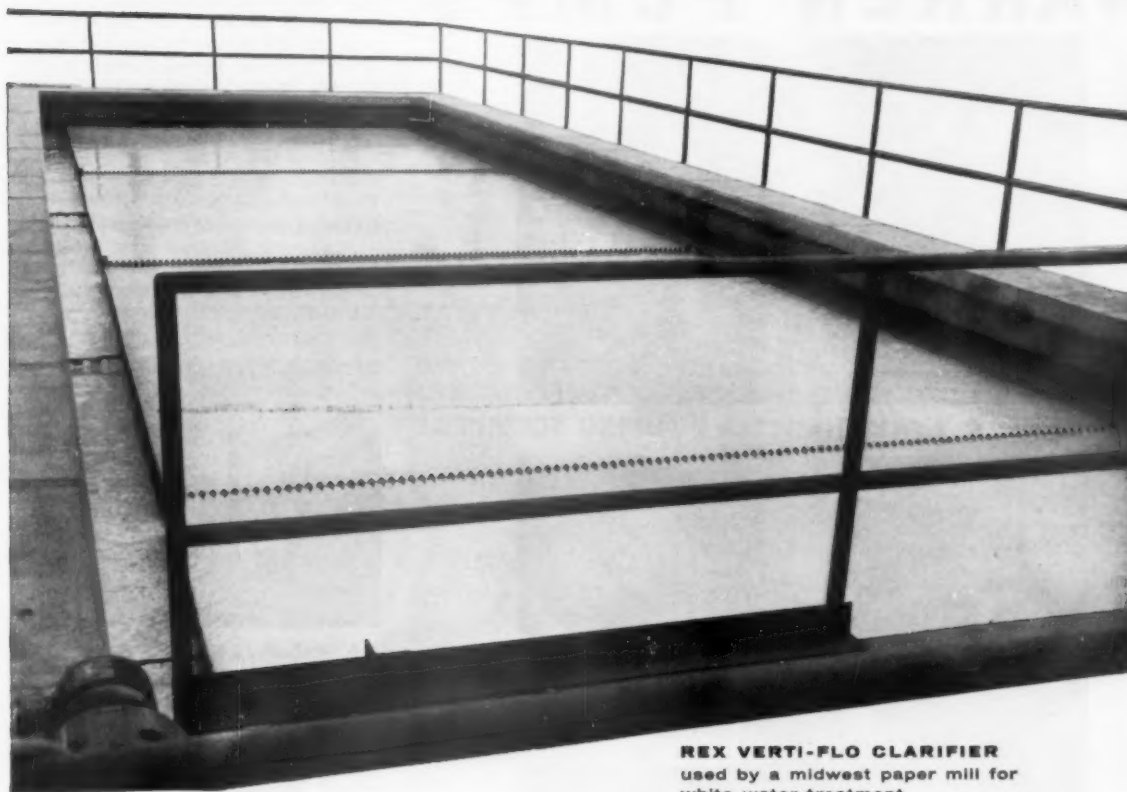
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Solution to pollution...



REX VERTI-FLO CLARIFIER
used by a midwest paper mill for
white water treatment.

cuts water consumption 62%

State regulations required a leading Midwest paper mill to clarify its waste water—to remove the cellulose, cotton fibers, clay, chemicals, starch and dye.

Looking for a low-cost clarifying method, the firm found an answer that not only cut equipment cost, but is actually saving 62% on water consumption. The REX VERTI-FLO CLARIFIER shown above is so efficient that it allows the firm to re-use 62% of the water formerly wasted—reclaiming 5 m.g.d. out of an 8.5 m.g.d. requirement.

400% BOOST IN CLARIFYING CUTS TANK COST

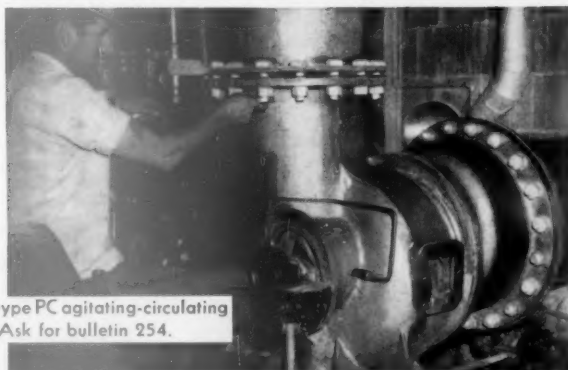
Due to its unique clarifying technique, this REX VERTI-FLO Tank is just one-fourth the size of

a conventional tank. Yet, it handles the same volume of water and provides a far clearer effluent. Savings here in tank construction cost and space are obvious.

Interested in turning waste water into profit, and in eliminating pollution the economical way? Write for information on the complete line of Rex Water and Waste Treatment Equipment. CHAIN Belt Company, 8641 W. Greenfield Ave., Milwaukee 1, Wisconsin.

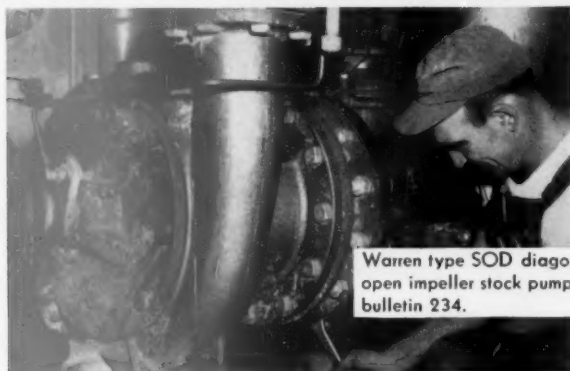
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**SEWAGE AND WASTE
TREATMENT EQUIPMENT**

All through the New RED BLUFF PLANT OF DIAMOND NATIONAL CORPORATION, **WARREN PUMPS**



Warren type PC agitating-circulating pump. Ask for bulletin 254.

HANDLE NEARLY ALL THE VITAL PUMPING SERVICES



Warren type SOD diagonally split, open impeller stock pump. Ask for bulletin 234.

THAT STRICT PRODUCTION SCHEDULES DEPEND ON

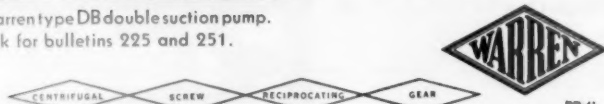


Warren type DB double suction pump. Ask for bulletins 225 and 251.

More than 120 WARREN PUMPS

are operating at the new Diamond National plant at Red Bluff, California.

With the help of Warren engineers, the progressive planners of this modern integrated forest products plant selected nearly the entire range of Warren stock and water pumps. That's a sound indication of implicit trust in Warren's ability to design and produce the most efficient pumps for all types of plant services.



PP-41

WARREN PUMPS, INC. WARREN, MASSACHUSETTS

Robert W. Appleby of the USFS transfers from the Milwaukee regional office to the Pacific Northwest regional office, Portland, where he is assigned sales administration. . . . **Willfred M. McKay** is named woodlands gen. mgr. for the Eastern Fine Paper & Pulp div. of Standard Packaging Corp., Bangor, Maine. He succeeds **D. B. Demeritt**, who has resigned to devote full time to his responsibilities as vice pres. and director of Dead River Co. Mr. McKay was formerly mgr. of woods operations.

Simpson Logging Co. promotes **H. O. Puhn** from timber and land mgr. to resources and services mgr. at the Shelton, Wash. headquarters; **Max Schmidt Jr.**, former logging mgr. of Washington operations, becomes Washington timber and land mgr.; **Dale Davis** is promoted from Oregon logging mgr. to Oregon timber and land mgr.



J. E. McCaffrey Honored by American Pulpwood Assn.

Mr. McCaffrey (l) is vice pres. of International Paper Co. He was cited for his outstanding service to the association. In charge of woodlands operations for International, Mr. McCaffrey was APA president from 1950 to 1952, is a member of the advisory council of President Eisenhower's Outdoor Resources Review Commission. Making the presentation is **J. A. Holekamp**, APA field engineer.

Canada

Martin Paper Products Ltd., subsidiary of McMillan, Bloedel & Powell River Ltd., announces several executive appointments: **H. V. Townsend** as gen. mgr. responsible for operations of the five corrugated container plants (St. Boniface, Man.; Regina, Sask.; Calgary and Edmonton, Alta.); **R. C. Lemon** as mgr. of the New Westminster, B. C. plant, and **W. A. Buhler** as New Westminster production mgr. . . . **Reed O. Hunt**, president of Crown Zellerbach Corp., San Francisco, toured Crown Zellerbach Canada Ltd. operations in British Columbia early in August. . . . **Peter J. G. Bentley**, director of Canadian Forest Products Ltd. and son of Vice Pres. **L. L. G. Bentley**, has been elected president of the Vancouver, B. C. chapter, Society for Advancement of Management.

10 good reasons for choosing Dynamatic Eddy-Current Speed Control Equipment

1 Adjustable speed from AC power

2 Accurate speed control

3 Wide speed range

4 Rapid response

5 Low power loss

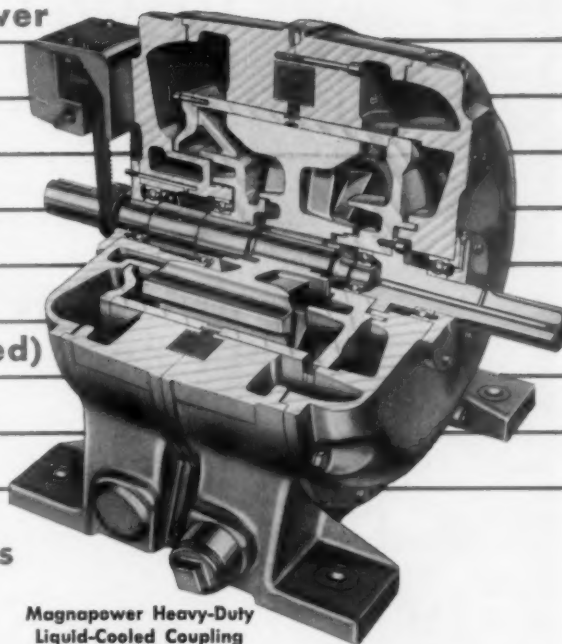
6 Simplified construction

7 Remote control (when desired)

8 Quiet, efficient operation

9 Low maintenance cost

10 No commutators, rings, brushes, or rotating coils



Magnapower Heavy-Duty
Liquid-Cooled Coupling

Using standard alternating current as a power source, Dynamatic Eddy-Current Couplings and Drives are the answer to practically all stepless adjustable speed requirements.

A wide range of standard and special control features may be obtained from electronic or transistorized magnetic amplifier control systems. The addition of an eddy-current brake to standard couplings or drives provides smooth, cushioned stops and controlled deceleration.

Dynamatic Eddy-Current Equipment is available in sizes from 1/4 hp Adjusto-Spede Drives to heavy-duty Magnapower Couplings rated up to 20,000 hp—and larger.

Place your speed control problems in the hands of experts. Our representatives, located in all principal cities, are fully qualified to discuss your speed control problems and suggest Dynamatic Equipment that will do the best job for you. Call Dynamatic today—there is no obligation.



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ORIGINATOR
AND LEADING PRODUCER
OF EDDY-CURRENT
SPEED CONTROL
EQUIPMENT

May we Send You Illustrated Literature Describing Dynamatic Eddy-Current Equipment

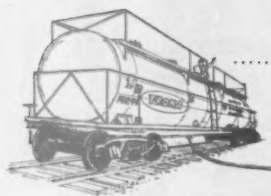
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TRONA®...the largest domestic producer of both sodium chlorate & salt cake for the pulp & paper industry



TRONA . . . Papermakers' grade SALT CAKE
ABERDEEN and HENDERSON . . . Highest quality SODIUM CHLORATE



*fast, efficient delivery of Sodium Chlorate
with Trona's new, modern fleet of tank cars.*

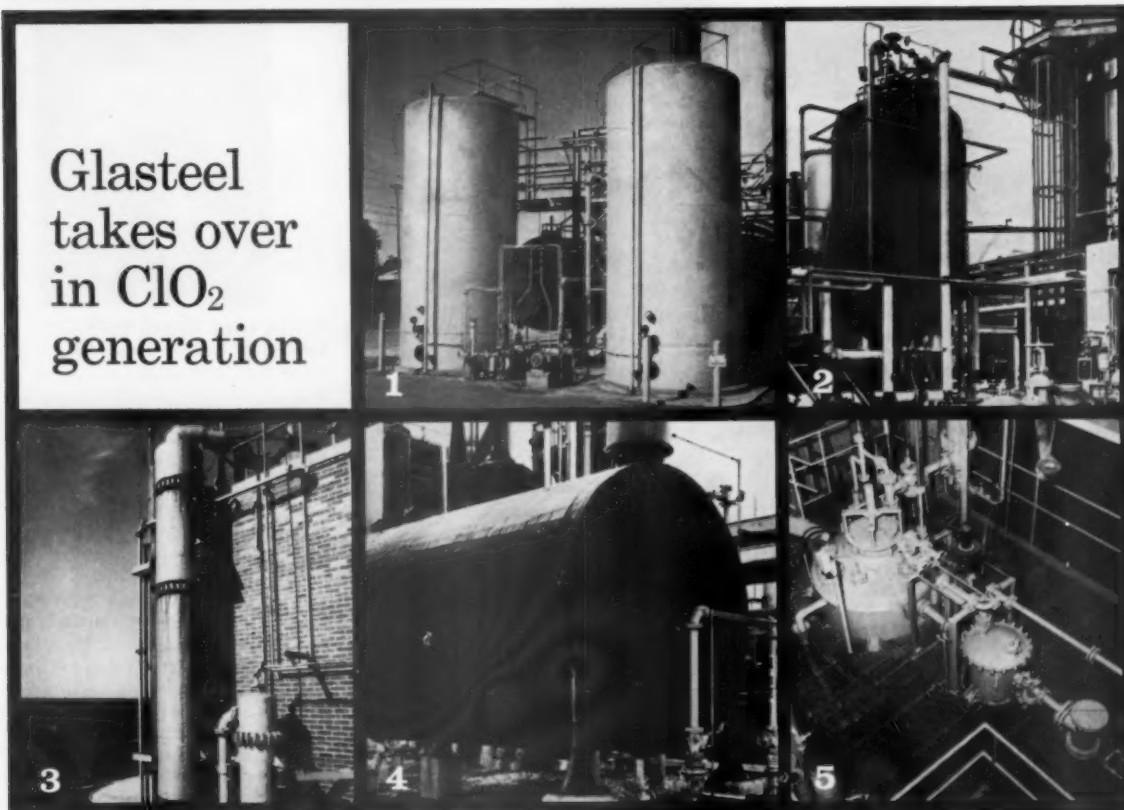


American Potash & Chemical Corporation

3000 WEST SIXTH STREET, LOS ANGELES 54, CALIFORNIA
99 PARK AVENUE, NEW YORK 16, NEW YORK

FLUIDICS* AT WORK

Glasteel
takes over
in ClO_2
generation



1. **SODIUM CHLORATE** 20,000-gallon storage tanks at Scott Paper Company's mill in Mobile, Alabama, are made from Pfaudler® Glasteel to eliminate corrosion at constantly changing liquid-air interface and assure clean chlorate supply. In capacities of 10,000 gallons and over, Glasteel costs less than stainless steel.

2. **PRIMARY ClO_2 GENERATOR** at Marathon Southern, like most of the other equipment, is made of corrosion-resistant Glasteel. It has a five-ton-per-day capacity.

3. **ABSORPTION COLUMN (left) and SCRUBBER COLUMN (right).** Two of several Glasteel columns in use in ClO_2 plants for either absorption, stripping or scrubbing.

4. **CHLORINE DIOXIDE** stays safe and pure until it's ready for use in this 15,000-gallon tank of Glasteel construction. There are more than 20 such Glasteel ClO_2 solution storage tanks in use today in North America.

5. **PROJECT ENGINEERING SERVICE** offers complete design, layout, procurement, installation and operator training—a turn-key job for an integrated, economical plant. The "Puffless Wonder" is what they're calling this Pfaudler-engineered plant at Gaspesia Sulphite Company, Ltd., at Chandler, Quebec. Shown are Glasteel primary and secondary generators and stripping column with F-C (field-cut) Glasteel pipe.

Why Glasteel in all this key equipment for making chlorine dioxide? Because it is the one material that can economically handle all the corrosives encountered. And, Pfaudler can provide about everything you need—from major equipment and accessories to complete engineering service. For more details, send for Reprint No. 535. Write to our Pfaudler Division, Dept. PP-90, Rochester 3, New York.



PFAUDLER PERMUTIT INC.

Specialists in FLUIDICS... the science of fluid processes

*FLUIDICS is the Pfaudler Permutit program that integrates knowledge, equipment and experience in solving problems involving fluids.

Meet Huyck's McClure



William C. McClure, a graduate Industrial Engineer from Lafayette College, is Field Assistant to Huyck's Sales Manager. Bill joined Huyck in 1951 and has several years' experience as a Field Service Engineer. It was his suggestion to establish the Huyck Felt Workshop Program to provide better communication between papermakers and felt-makers. Bill continues to work closely with papermakers to bring them the latest advancements in felt application and provides close liaison between our Field Staff and Felt Manufacture and Design.

HUYCK FELTS

First in Quality . . . First in Service Since 1870

PULP & PAPER

G. Howard Smith, gen. mgr., Don Valley Paper Co., Toronto, has been re-elected chairman, Industrial Relations Section, CPPA, and F. W. Johnson, Consolidated Paper Corp., was re-elected vice chairman.



A. T. Easley, Marketing Mgr. for Fraser Companies Ltd.

He will be in charge of the Edmunston, N. B. company's sales of pulp, paper and paperboard. He was first resident mgr. of the sulfite pulp mill of North Western Pulp & Power Ltd. at Hinton, Alta., and in 1958 joined the New Brunswick firm as asst. to the gen. mgr., the position he held prior to his recent appointment.

Strictly Personal



O. T. Dalley Heads Tech. Set-Up at Celgar Pulp Mill

Beginning his industry career in New Zealand following graduation from the Univ. of Canterbury (N.Z.) with an M.Sc. degree, Mr. Dalley has been closely associated with pulp production in North America through employment with Marathon Corp. of Canada Ltd. and Champion Paper & Fibre Co. At Celgar Ltd. in Castlegar, B.C., he will be concerned with bleached kraft pulp production. Prior to coming to North America, Mr. Dalley served as a process engineer in the heavy chemical industry in Australia and as a research chemist for New Zealand Forest Products Ltd. He supervised installation of the laboratory at NZFP's new pulp mill at Kinleith and served as shift chemist and technical supt. between 1953 and 1956. He later went to Canada as a laboratory supervisor and control chemist in the Ontario mill of Marathon, following which he was on the staff of the Carolina div. of Champion Paper & Fibre.



Costen



Travers

To Celgar's Sales Staff

Columbia Pulp Sales Ltd., Vancouver, B.C.—distributor for Columbia Cellulose Co. Ltd.'s sulfite pulps produced at Prince Rupert and Celgar kraft, to be made at a mill now under construction at Castlegar—has named **Thomas A. Costen** and **Joseph S. Travers** sales representatives. Mr. Costen is a graduate of Yale Univ. and the Centre d'Etudes Industrielles of Geneva, Switz. He will be in the firm's Vancouver offices. Mr. Travers was educated at Ashbury College and Carleton Univ. and will work out of Montreal.

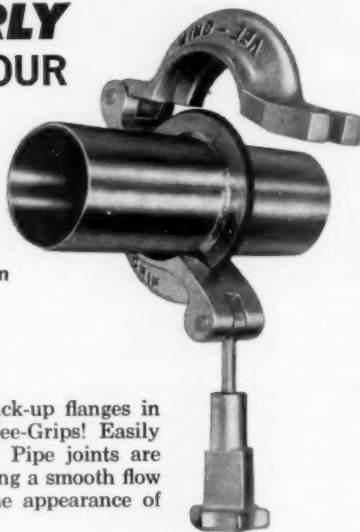
INSTALL OVERLY VEE-GRIPS IN YOUR STOCK LINES

- A tight seal in seconds.
- Pipe is held in perfect alignment.
- Weigh less and cost no more than ordinary back-up flanges.
- Available for 3", 4", 6", 8" and 10" tube and pipe.

Save time! Replace ordinary back-up flanges in your stock lines with Overly Vee-Grips! Easily put on or taken off in seconds. Pipe joints are held in perfect alignment, assuring a smooth flow of stock. They also improve the appearance of your stock line installations.

Write for catalog and prices

Serving the paper industry in custom metal fabrication of engineered air systems — machine hoods — Gardner Dryers — Westinghouse Sturdevant fans and steam coils — stock pipe — distributor rolls — suction boxes — white-water pans — head boxes — tanks.



Box 468 Neenah Wisconsin

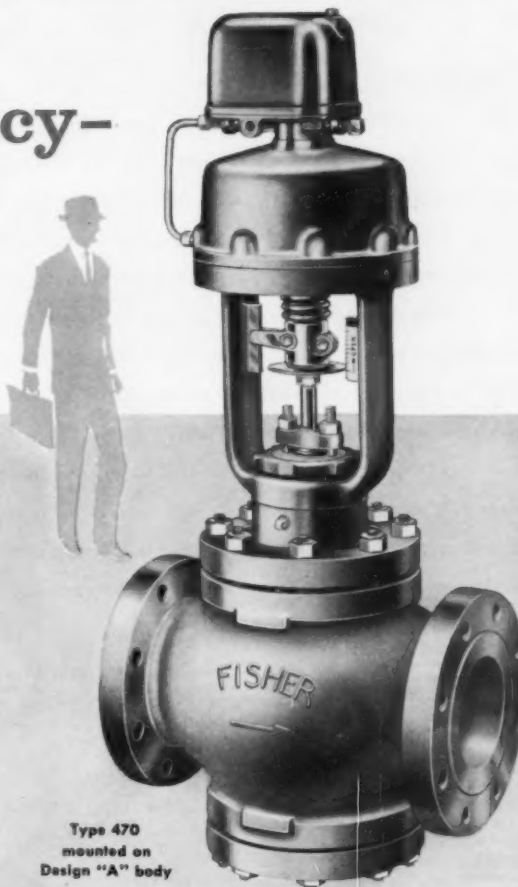
YOUR **FISHER/MAN** STANDS BEHIND THIS PNEUMATICALLY OPERATED PISTON...

FOR Inherent Accuracy— Power—Speed and Stability

FISHER TYPE 470 P.O.P.

- ▶ Delivers same power in either direction at any point of the stroke.
- ▶ Adaptable to virtually all types of valve bodies including Butterfly valves.
- ▶ No air set required—utilizes clean, non-corrosive air or gas up to 150 psi.
- ▶ Easily reversible actuator can be changed in the field.

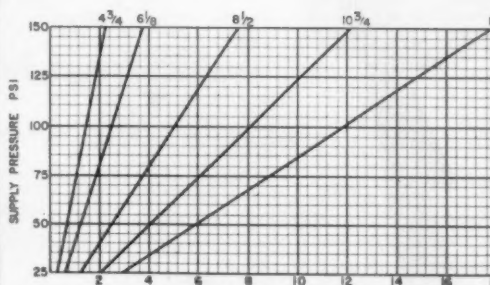
This small, compact piston actuator incorporates its own positioner mounted integrally on top of the cylinder. Positioner receives any of the normally used pneumatic instrument signals. Then, without an air set, actuator utilizes the full potential of the available instrument or gas supply to provide exceptional speed and power. Series 470 is available in six basic sizes and can be supplied for travel up to 4". Basic actuator can also be furnished with a handjack, hydraulic snubber, pneumatic safety devices or as a spring return unit. Write for Bulletin E-470.



Type 470
mounted on
Design "A" body

PERFORMANCE DATA

Air Consumption (Static)	20 SCFH at 100 psi supply.
Instrument Signals	3 to 15 psi, 5 to 25 psi, 6 to 30 psi, 12 to 60 psi. Suitable for split range also.
Temperature Limitation	175°F.
Maximum Hysteresis	0.15% of total stroke or instrument signal.
Repeatability	0.03% of the total stroke or instrument signal.
Resolution Sensitivity	Minimum change in the measured variable to produce an effective movement of the final control element is .02% of the instrument pressure range.
Frequency Response	1.4 cps for the Size 60. 4 cps for the Size 30.
Load Sensitivity	Percent of total travel per 100 lbs. stem force is .065% for Size 60.



STEM FORCE - 1000 LBS
CYLINDER DIAMETERS AS MARKED ON EACH CURVE.

AVAILABLE STEM FORCE



IF IT FLOWS THROUGH PIPE ANYWHERE IN THE WORLD... CHANCES ARE IT'S CONTROLLED BY...

FISHER GOVERNOR COMPANY

Marshalltown, Iowa / Woodstock, Ontario / London, England

BUTTERFLY VALVE DIVISION: CONTINENTAL EQUIPMENT COMPANY, CORAOPOLIS, PA.



Where can faster, more accurate screening make your process more profitable?

In the pulp and paper industry, SWECO Vibro-Energy Separators have become the standard for continuous accurate separation of screenable material. Because of their high capacity, efficiency and range of applications, they are used in 78 major plants in the paper industry for screening clay slips, starch solutions, paper coatings, adhesives and other materials.

In the manufacture of pulp (sulphite, sulphate, soda and groundwood pulp processes are basically similar insofar as screening operations are concerned), there are at least three operations where SWECO Separators can be used profitably: separation of bark from water, dewatering of rejects, separation of solids from effluent.

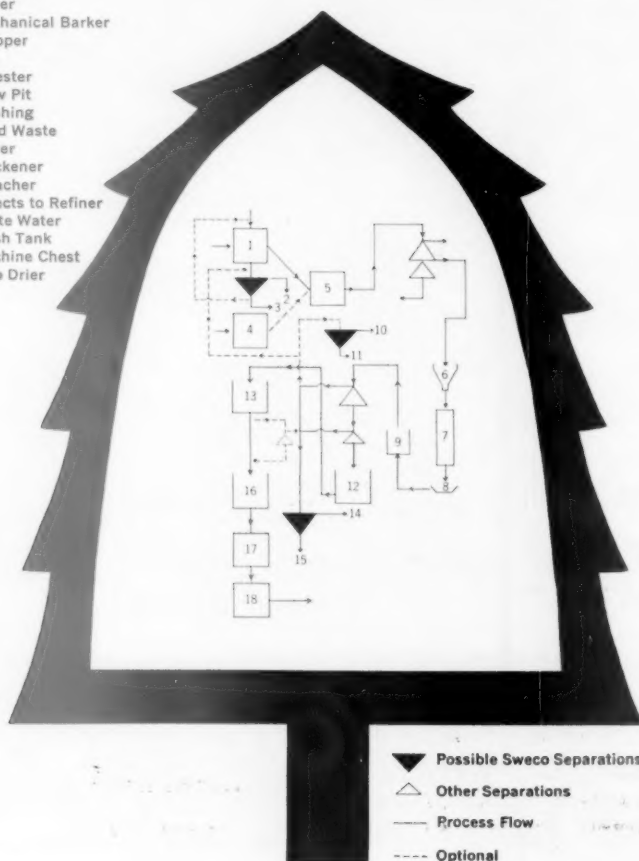
A SWECO District Engineer will be glad to go over flow sheets of your process with you, show where SWECO Separators can make more profit for you, and give a demonstration of a SWECO Vibro-Energy Separator in your plant with your process materials. Write Department 7-19.



SOUTHWESTERN ENGINEERING COMPANY, 4800 Santa Fe Ave., Los Angeles 58

Engineers • Constructors • Manufacturers

1. Hydraulic Barker
2. Waste
3. Sewer
4. Mechanical Barker
5. Chipper
6. Bin
7. Digester
8. Blow Pit
9. Washing
10. Solid Waste
11. Sewer
12. Thickener
13. Bleacher
14. Rejects to Refiner
15. White Water
16. Wash Tank
17. Machine Chest
18. Pulp Drier



Arthur F. Armstrong, president and managing director, Westminster Paper Co. Ltd., New Westminster, B.C., has been elected to the board of directors of B. C. Forest Products Ltd. Both companies are associated with Scott Paper Co. . . .

Gordon Godwin, graduate of the University of Washington's forestry school and active in the logging industry in the West before going East to join the Ontario Paper Co., is now general manager-woodlands, Ontario Paper Co., at head office in Montreal, where he has been assistant woodlands mgr., assistant general woodlands mgr. and assistant to the vice president-woodlands since 1944. He is a former chairman of the woodlands section CPPA, and past president of the Ontario Forestry Association. His latest promotion was announced by H. Arthur Sewell, executive vice president.

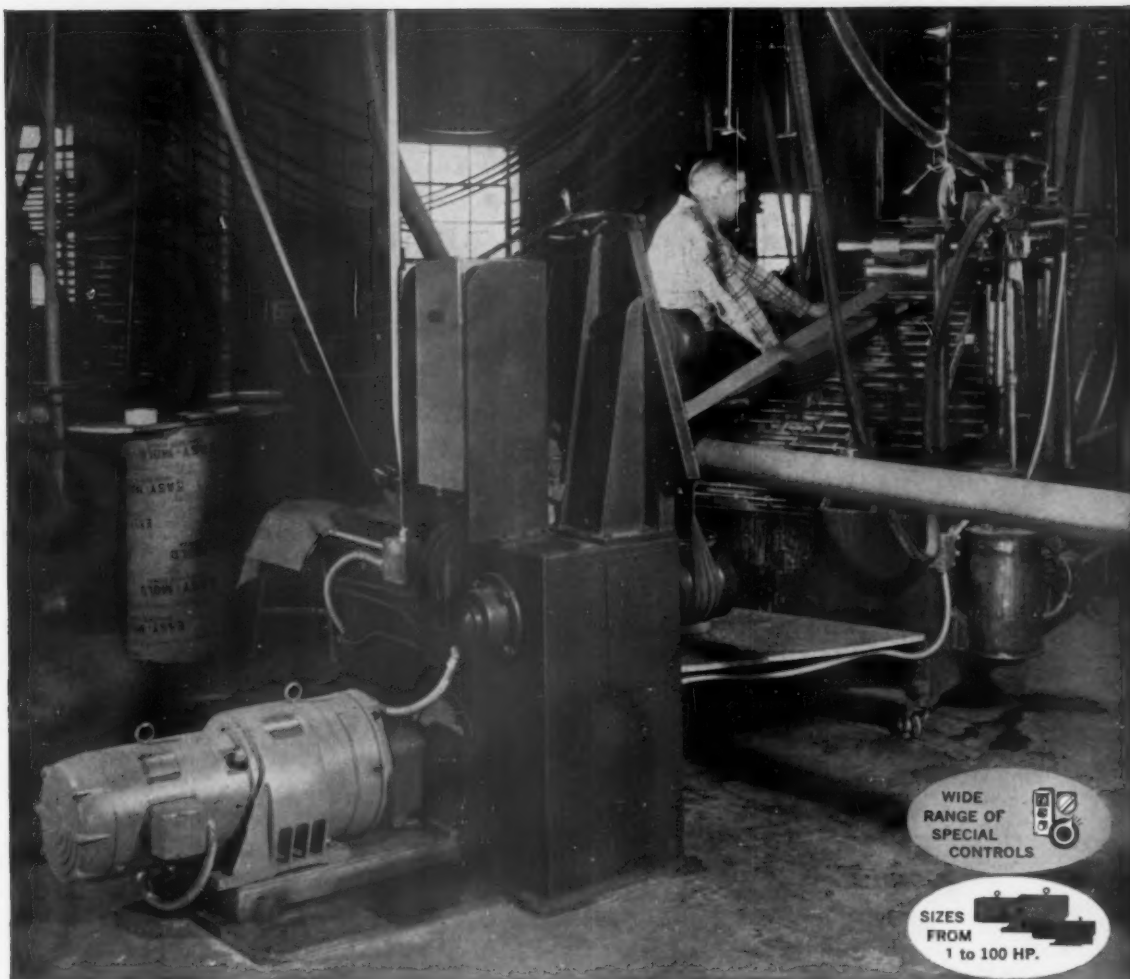
T. B. Fraser, of Baie Comeau, Que., has been appointed general manager, woodlands, Quebec North Shore Paper Co., according to announcement by Pres. Arthur A. Schmon. He has been associated with the company more than 25 years and was one of the pioneers in the early development of Baie Comeau as a newsprint-producing area.

Wilfred P. Maloney has been named town engineer for Anglo-Newfoundland Development Co. He was formerly a member of the town engineering department. James Delaney, former paper mill supt. of that company at Grand Falls, Nfd., has been made paper mill consultant, while Joseph Blackmore, former assistant paper mill supt., has succeeded Mr. Delaney as paper mill supt., with John Ryan and Cyril Down assistant paper mill supts.

L. G. Harris, formerly manager of the Harmac bleached kraft mill of MacMillan, Bloedel & Powell River, Ltd., on Vancouver Island, has been appointed manager of pulp sales at Vancouver head office. Larry Harris was with several other Canadian companies during mill construction periods and played an important part in the building of the original Bloedel mill at Port Alberni. He has been succeeded as manager at Harmac by Einar Walloe, formerly assistant manager and supt. at Port Alberni and Harmac.

Don McLaurin, who has been management consultant for the new fine paper mill of MacMillan, Bloedel & Powell River, Ltd., at Annacis Island, near New Westminster, B.C., has been appointed manager of the operation. Mr. McLaurin was formerly with the Institute of Paper Chemistry at Appleton, Wis., and Gilbert Paper Co., prior to which he was on the Pacific coast with Powell River Co.

St. Regis-Consolidated Packaging Ltd. reports the following appointments: K. Ross Hughes becomes comptroller; J. Stuart Glass is named to the new post of director of engineering.—Charles L. Shaw



WIDE
RANGE OF
SPECIAL
CONTROLS

SIZES
FROM
1 to 100 HP.



Controls speed and tension on nine strips of paper at one time

Louis Allis Ajusto-Spede® Drive speeds core winding

Note that the paper strips are fed to the core winder from varying heights and distances. A split second later they emerge as a tightly-wound core whose smoothness approaches extrusion. This job utilizes the superior control of speed and tension that the Louis Allis Ajusto-Spede offers.

This remarkable drive puts fast, high-quality production at your operator's fingertips. He simply dials the desired speed — and the Ajusto-Spede delivers it. The soft start, accurately controlled acceleration, and smooth break-away assure proper tension on the paper at all times. The precise control of speed saves time, paper, and handling. Breaks and downtime are vir-

tually eliminated. Production goes up, costs down.

Louis Allis engineers can apply the Ajusto-Spede Drive and control to any paper operation. They can tailor it for mixing, batching, and flow operations . . . for winding, laminating, extruding, and other processes . . . and for single-drive operations or for interlocked multi-drive systems with "one-dial" master speed control. And you can handle tissue, heavy board stock, parchment or paper.

Contact your nearby Louis Allis District Office for more information or specialized help. Or write for Bulletin 2750 and 2800 to The Louis Allis Co., 444 East Stewart Street, Milwaukee 1, Wisconsin.

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AS-212

LOUIS ALLIS

MANUFACTURER OF ELECTRIC MOTORS AND ADJUSTABLE SPEED DRIVES



ESCO DIGESTER CASTING

still going  strong AFTER 28 YEARS

This ESCO Alloy 45S top digester relief strainer casting is still resisting the corrosive attack of sulphur dioxide, acid fumes and steam at 280°F. and 80 psi. after 28 years of continuous service. This is but one of many, many testimonials that demonstrate the thorough understanding of pulp mill requirements by ESCO metallurgists.

Tell your nearby ESCO representative about corrosion problems in your plant, or write direct. Ask for your free copies of Alloy Notebook No. 7, "What Is Corrosion?", and the Process Equipment Catalog 175.

ESCO knows digester systems and makes a complete line of custom valves and fittings. ESCO custom castings in Alloy 40, 40L, 45L, 45S, 43H, 32C, 20 (Duriron) and Hastelloy* are found in pulp mills everywhere.



*Trademark Union Carbide Corporation

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MFG. PLANTS AT PORTLAND, ORE. AND DANVILLE, ILL.
Offices in Most Principal Cities
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 See you at PIMA (Northeast Div.), Poland Springs, Maine, Sept. 23-24.

*An economical, high quality combination
of starches from a single source for
internal sizing and external coating...*

**GLOBE® and
GLOBE®
EASY-ENZ**
starches



WRITE OR PHONE Corn Products for expert technical assistance...
helpful data on these fine products for Papermakers:

BUFFALO® • GLOBE® • TEN-O-FILM® • MILO-FILM® • TEX-O-FILM® • FOXHEAD® starches • **GLOBE®**
dextrines and gums • **EXCELLO®** dextrines

CORN PRODUCTS COMPANY INDUSTRIAL DIVISION • 10 East 56 Street, New York 22, N. Y.

FULLER material-level indicators for bins and silos

For General Purpose and Hazardous Dust Locations

The Fuller Material-Level Indicator is a reliable high-level/low-level indicator that provides automatic control when a desired maximum or minimum level of material is reached.

The Material-Level Indicator automatically shows the level of pulverized, fine, crushed and granular materials—in a bin or silo—and readily "takes command" of such equipment as feeders, valves, elevators, and conveyors by starting or stopping equipment drive motors when a predetermined material level is reached.

Engineered and built for sustained operation over long periods of time, the sturdy Material-Level Indicator always registers true indication, regardless of momentary surges of bin material or the settling action of aerated, pulverized material.

Fuller Material-Level Indicator's Operation

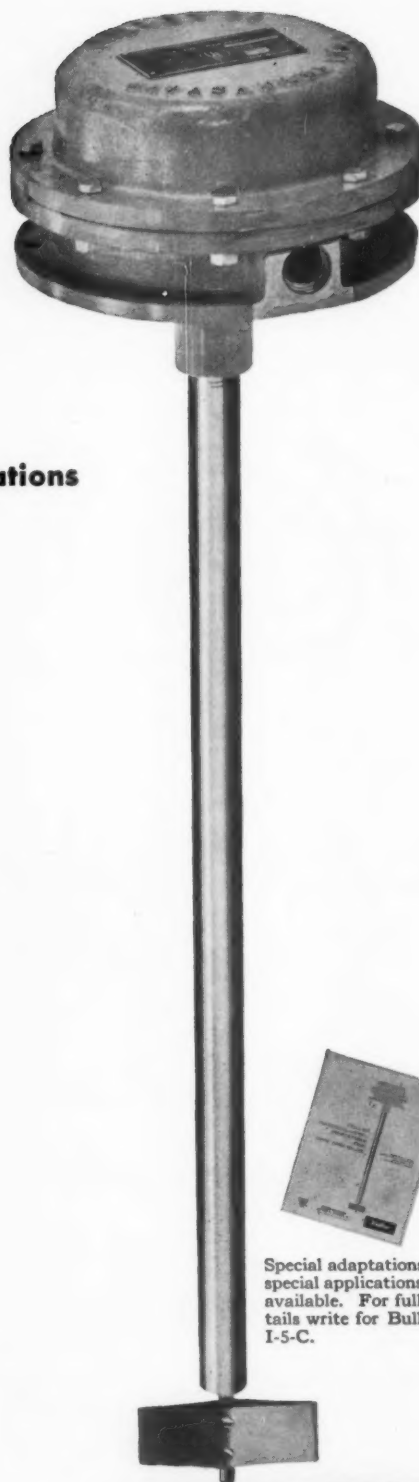
A sensing paddle, located at the desired material level, is constantly rotated by a shaded pole induction motor located in the casing outside the bin or container. The motor and its reduction gears are mounted on an extension of the paddle shaft. Whenever material restrains the paddle from turning, the motor and its mounting revolve about the drive shaft, actuating two switches mounted on the base of the indicator.

When material falls away from the paddle, an adjustable tension spring returns the motor and its frame to the initial position, releasing the switches and causing the motor to turn the paddle again.

For high-level indication or control, the motor runs continuously until paddle rotation is impeded by the rising level of material.

For low-level indication or control, the paddle is restrained by the material and in turn restrains switches until the material falls below the paddle. When this happens, an adjustable tension spring returns the motor assembly to the starting position, releasing the switches and again starting paddle rotation.

Model SG-4 is designed for general purpose applications; SG-4 is UL approved for hazardous dust locations, Class I, Group D and Class II, Groups E, F, G.



Special adaptations for special applications are available. For full details write for Bulletin I-5-C.



2636
E-9

180

FULLER COMPANY
128 Bridge St., Catasauqua, Pa.
Subsidiary of General American Transportation Corporation
Offices in Principal Cities Throughout the World



September 1960 — PULP & PAPER

Which valve alloy for your next job?

When you next have a requirement for high alloy valves, especially for corrosion service, why not come to the company with the most experience in this field.

Aloyco has specialized in the manufacture of stainless steel valves, exclusively, for over 30 years.

We have accumulated a wealth of know-how, not only on how to engineer valves for hard-to-handle corrosives, but also on what alloys are the most efficient and will give the longest life.

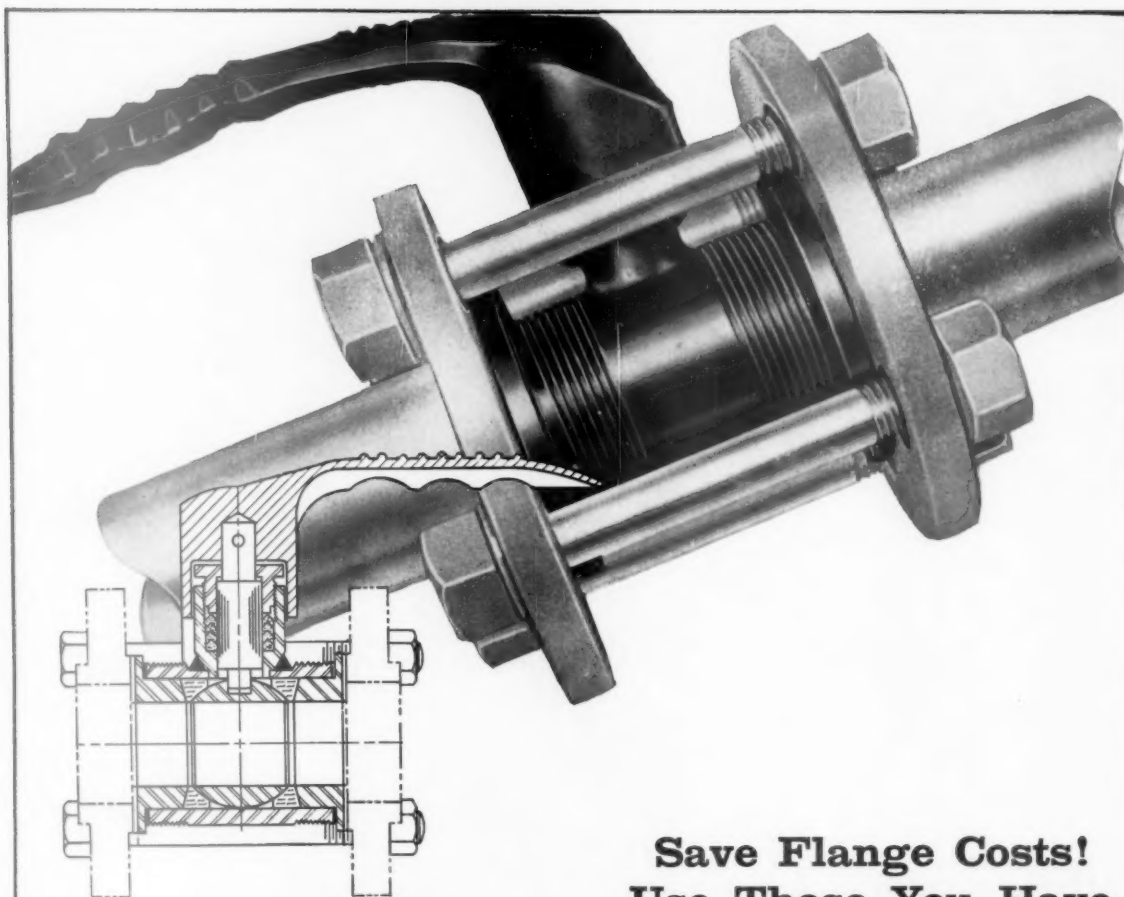
Aloyco's field consulting service is yours for the asking. Why not write or call our nearest sales office for help on your next alloy valve job. Alloy Steel Products Company, 1316 West Elizabeth Avenue, Linden, New Jersey. ☎ 10

Offices in: Boston • New York • Wilmington
Atlanta • Buffalo • Pittsburgh • Chicago
St. Louis • San Francisco • Los Angeles

These seven corrosion test specimens are just a few from hundreds of tests conducted by Aloyco to insure our valve customers of the right alloy for their particular job. Aloyco valves are supplied in such metals as 304 and 316 stainless steel, Aloyco 20, Nickel, Monel and Hastelloy B, C and D.

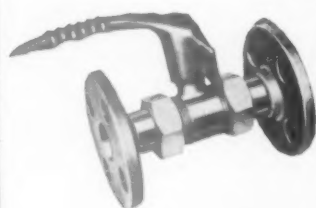


**ALLOY
STEEL PRODUCTS
COMPANY
LINDEN, N. J.**

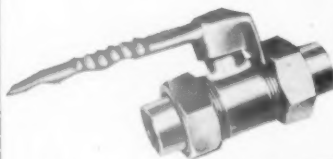


Save Flange Costs! Use Those You Have

Install Fullport Compression-Mounted Ball Valves in Seconds

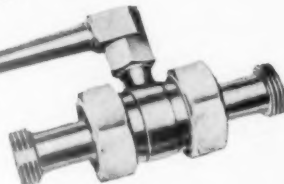


Fullport Stainless Steel
Flanged Ball Valve,
MSS and ASA face
to face dimensions,
#8002, 1/2" through
2", 150 PSI @ 400°F.
service.



Fullport Stainless Steel
Screwed Ends Ball
Valve #8001, 1/2"
through 2", 1000 PSI
cold non shock 300 #
@ 400°F. service.

Stainless Steel Sanitary
Ball Valve #8207, 1"
through 2", 150 # @
400°F. service.



Fullport Compression-Mounted Ball Valves Model #8009 slip between the flanges of your present piping system with a minimum of down time. These valves which have the largest turbulence free port openings of any ball valves can handle corrosives and slurries with equal ease. The positive slotted key drive in the ball eliminates ball wear and ball wobble, permits equal flow in either direction. You get the best features of a globe, gate and plug valve in every Fullport Compression-Mounted Ball Valve—at one low price. The Teflon seats, the extra deep stuffing box and the exclusive "V" ring packing which eliminates troublesome "O" rings are Fullport extras for extra valve service and extra long life. The stem packing, if it should ever be required, can be replaced while the valve is in operation.

Fullport Compression-Mounted Ball Valves are immediately available in stainless steel in sizes 1/4" through 6". They test to 1000 psi cold non shock service and 300 psi at 400° F. Through bolts for compression mounting are supplied with each of these valves.

For more information about this and other Cooper Alloy corrosion resistant ball valves write for catalog #BVFA.

COOPER ALLOY
Corporation • Hillside, New Jersey

Ground Detector

... Combines Fault Finder



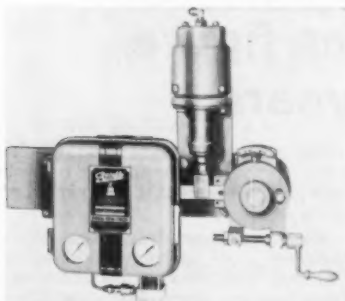
Applications: To locate accidental grounds while maintaining production.
Advantages: Brunt Faultfinder, it is claimed, can locate trouble in 20 min. without stopping production. Unit locates accidental grounds on power systems (both ac and dc) of up to 600v. Imposing only 2 amperes on the circuit, it cannot damage equipment on the line.

Specifications: New model weighs only 18 lbs., 33 1/3% less than original unit. Standard equipment includes double earphones with foam rubber covering; one-man operation is possible in locating cables, pipes and line signals above and below ground without climbing or excavating.

Supplier: Parr Mfg. Corp., 44 Austin St., Newark, N. J.

Moisture Detector

... Adjustable Sensitivity



Applications: For moisture control on any weight of paper—from 0.300 to the heaviest board.

Advantages: Designed for use with any Stickle Pres-Ten-Trol system to control moisture content automatically during drying, detector is equipped with a numbered dial that permits quick setting of any desired sensitivity; a proportional band prevents over-regulation. On machines running a

wide range of basis weights, best setting for each weight is said to be quickly obtained. An identical setting may be accurately duplicated whenever the same weight is run again.

Supplier: Stickle Steam Specialties Co., 2215 Valley Ave., Indianapolis 18, Ind.

Smoothness Tester

... Automatic Timing



Applications: For the numerical determination of the smoothness of paper.

Advantages: Bekk unit is based on principle that degree of air exclusion between a highly-polished glass disk and a piece of paper—pressed against the disk with a pre-determined pressure—depends on smoothness of paper surface facing the disk. The smoother the surface, the more complete the air exclusion.

Specifications: Smoothness is expressed as the time, in seconds, required for drawing the air from between the polished glass disk and the paper surface into air receiver of the apparatus.

Supplier: Testing Machines Inc., 72 Jericho Turnpike, Mineola, L.I., N.Y.

Pulpwood Log Loader

... One-Man Operation



Applications: For loading pulpwood-carrying trucks in the woods.

Advantages: A product of HIAB, manufacturer of hydraulic truck loaders,

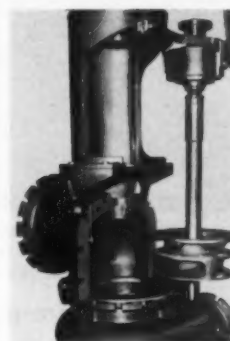
the Speedloader can be mounted on any truck or tractor. Power for operation is from the vehicle engine through a power take-off unit. Dual controls for ground loading enable the operator to handle materials from either side of the truck. Because of the knee-acting boom, no cables are required. Positive control of the grapple is by means of an hydraulic rotator.

Specifications: Unit can be mounted directly behind truck cab for self-loading or can be installed on separate vehicle for loading other trucks. A high operator's seat and special controls may be obtained for loading from a position over the cab. Speedloader may be had with either hydraulic grapple or timber tongs. Capacity is 6,000 lb. Double-acting outriggers are standard equipment.

Supplier: Stedt Hydraulic Crane Co., P. O. Box 188, Ashland, Mass.

Paper Stock Pump

... Redesigned



Applications: For pumping of stock.

Advantages: Redesigned for faster, easier maintenance, vertical Type TV now provides quick and easy replacement of any part in the rotating element without complete disassembly. Removal of the coupling guard provides access to the spacer type coupling, to thrust bearing assembly, to impeller clearance adjustment. Suction elbow is vertically split with one half removable. Bearing cartridge forms a complete enclosure for thrust bearings, affording protection from contamination and dirt even with the rotating element out of the pump.

Specifications: Available in capacities to 10,000 gpm, with heads to 270 ft. Units are said to occupy one-fourth the floor space of a comparable horizontal pump.

Supplier: Allis-Chalmers Mfg. Co., 1126 South 70th St., Milwaukee 1.



A MEASURE OF PERFORMANCE. After two years' service during which power requirements varied between 600 and 1000 hp, these nickel stainless steel discs

show wear averaging only .0027" per month, evenly distributed and with parallelism retained. Photo courtesy E. D. Jones Corp., Pittsfield, Mass.

Resist corrosion and erosion

Nickel stainless steel discs figure to last more than 23 years

Take note of this date: September 7, 1957.

That was the day a nationally known paper company began board production, using 10 Jones Double-D refiners for primary and secondary refining of highly corrosive pulp. Each refiner is equipped with nickel stainless steel discs through which the pulp is refined.

Two full years passed. Late in 1959, inspection of the all-important discs indicated that all were in excellent shape. Wear? Only .065" — all evenly distributed, and with parallelism perfectly retained.

Regular six-month inspections show a maximum wear of only .0027" per month on the stainless discs. Applied against the available

disc wear of .750", this figure actually indicates a disc life of more than 23 years.

It's easy to see why. Nickel stainless steels combine exceptionally high resistance to corrosion and erosion with at least four other important characteristics:

- High strength
- Stiffness
- Good machinability
- Long wearing qualities

That's why nickel stainless steels are finding such widespread use in mills today. Cast—or machined from plate

—the pulp and paper industry has proved them dependable on jobs where many metals simply don't work out.

Have you a problem that a nickel stainless steel casting might solve? You may find the solution in our new free booklet, *Heat Resistant Castings, Corrosion Resistant Castings, Their Engineering Properties & Applications*. Sent without obligation. Just write for "Booklet A-266."

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street  New York 5, N. Y.

INCO NICKEL

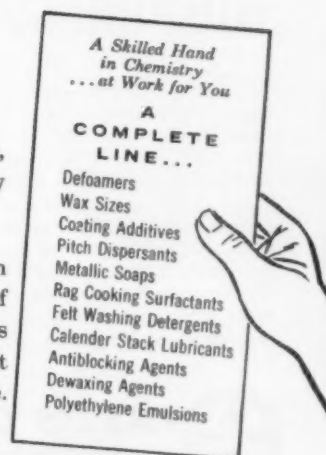
NICKEL MAKES ALLOYS PERFORM BETTER LONGER



make
cleaner paper
with
NOPCO® DEFOAMERS
backed by
Nopco know-how

One of the causes of a bad run of paper can be foam. Bubbles that carry fiber, size or color on their surface burst and leave light spots. Those that carry filler or dye leave dark spots. Either way, the sheet won't pass inspection.

Many variables contribute to foam formation. Since each mill has its own distinct foaming problems—because of differences in equipment, type of water, chemicals used and running speeds—it takes a wide range of defoamers to meet them all. Let your Nopco specialist work with you to develop the best system for your conditions. Write for specific information and for literature.



NOPCO **NOPCO CHEMICAL COMPANY**
60 Park Place, Newark, N.J.

Plants: Harrison, N.J. • Richmond, Calif. • Cedartown, Ga. • London, Canada • Mexico • France
Manufacturing Licensees Throughout the World

PAPER CONDITIONING

THE MODERN EFFICIENT
ECONOMICAL WAY

**BUILT TO OPERATE AT
ANY MACHINE SPEED**

SYSTEMS ALSO BUILT FOR
APPLYING SIZING MATERIALS,
STARCHES, WAX EMULSIONS,
PLASTICISERS AND OTHER
SURFACE FINISHING
SOLUTIONS

**BUILT FOR MANUFACTURING
OR CONVERTING PROCESSES**

VAPO SYSTEMS
128-32 W. Home Ave.
Villa Park, Ill.



NEW EQUIPMENT

Midget Transmission

... Heavy-Duty Service



Applications: For chemical metering and circulating pumps and other small processing drives.

Advantages: Any-Speed units are designed to convert any constant speed input power into an infinitely adjustable output speed. Operator can pre-set and select one or more adjustable speeds in one or both directions up to 1,650 rpm. Integral with these units is a gear pump for supercharge, control and auxiliary service; a cooling fan; a fluid reservoir case, and overload relief valves. Designed for appli-

cations of 1 hp and less, units consume power only in proportion to work performed. No restricted-flow or directional control valves are used. **Specifications:** Input speed, 1,750 rpm; output speed (at normal torque), variable up to 1,650 rpm; starting torque, 62 lb. in.; normal torque, 45 lb. in.; peak torque, 67 lb. in.; approximate output, 1 hp; net weight, 90 lb.; length, 15 in.; width, 14 in.; height, 10 1/2 in. Standard transmission and speed control devices are available for direct or remote control, manual or automatic operation, open or closed loop control systems.

Supplier: The Oilgear Co., 1560 W. Pierce St., Milwaukee 4, Wis.

Chain Saw

... More Power Claimed



Applications: For pulpwood felling and cutting.

Advantages: Claimed to be the "world's most powerful" chain saw line, these units incorporate a larger piston and cylinder in the short-stroke engine design. A new clutch spider transfers more of the available power to the chain. Gear drive models feature wider and stronger powdered steel gears. Long-flange chain guide plates feed the chain smoothly into the bar groove, thus extending life of both bar and chain, as well as increasing operator safety.

Specifications: Air filter is said to be completely sealed against debris. Other features include: all-position diaphragm carburetor, automatic clutch, simple piston pump oiling. Attachments include: 16-in. plunge-cut bow, clearing bar, brush-cutter. Eight models available, largest being 900-C for felling trees up to 10 ft. in dia.

Supplier: Homelite (a div. of Textron Inc.), Port Chester, N.Y., Tel: WESTmoreland 9-3400.

MANY FAST'S HAVE BEEN WORKING LONGER THAN YOU

It's a fact. There are plenty of cases where Fast's Couplings have been in service 20 to 40 years. And some of our more enthusiastic engineers say a Fast's should last forever if it's properly applied, installed and lubricated. Whatever opinion you accept, you can bet Fast's Couplings will give you the same smooth-running, low-maintenance, long-lived per-

formance that makes them the choice of more equipment manufacturers than any other gear-type coupling.

For example, Fast's Coupling No. 1347, shipped in July, 1922, is still in service—and the customer is just ordering his first spare coupling 38 years later. KOPPERS COMPANY, INC., 1309 Scott Street, Baltimore 3, Md.



FAST'S COUPLINGS
Engineered Products Sold with Service





A Sonoco core specialist is nearby!

Core specialists are located at SONOCO plants from coast to coast to personally assist you. They represent a company that can meet your most demanding requirements for core strength, tolerance and economy. This is possible because SONOCO has 60 years' experience, completely integrated manufacturing facilities and a continuous research program.

SONOCO cores are made to exacting torque and crush strength specifications. Non-returnable cores are available in all sizes. Returnable cores, with or without famous SONOCO metal ends, are made in all standard sizes. SONOCO can also supply a complete line of metal end core machinery and core cutters.

Regardless of your core needs, you'll get more for your core dollar from SONOCO in service, quality and economy. Call or write today!



SONOCO
Paper Mill Cores
SONOCO PRODUCTS COMPANY

Main Office — Hartsville, S. C.

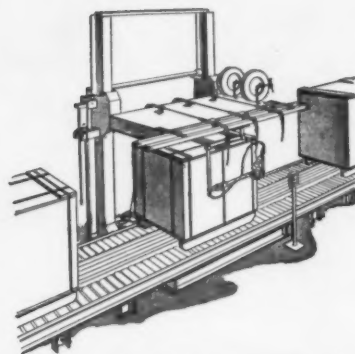
- Mystic, Conn.
- Akron, Ind.
- Lowell, Mass.
- Holyoke, Mass.
- Phillipsburg, N. J.
- Longview, Texas
- Philadelphia, Pa.
- La Puente, Cal.
- Fremont, Cal.
- Atlanta, Ga.
- Brantford, Ont.
- Granby, Quebec
- Mexico, D. F.

1102

Here's proof: you can reduce paper slippage the Signode way



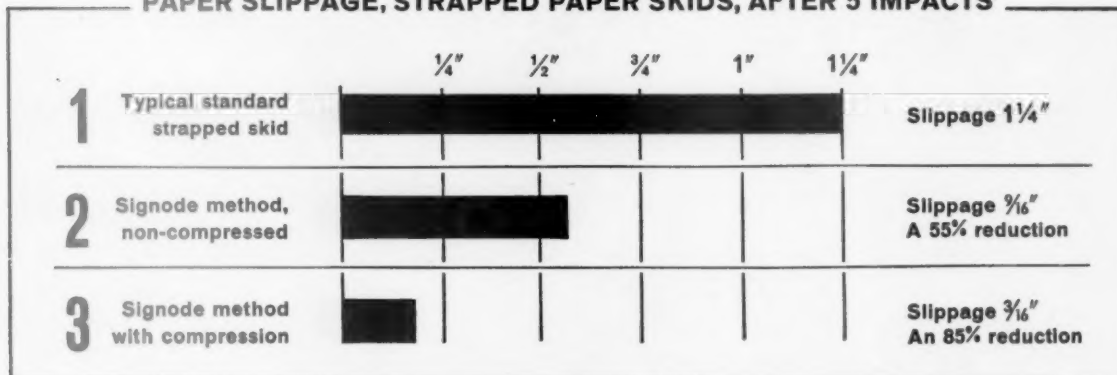
...55% without compression



...85% with compression

Signode engineers ran accelerated impact tests on an impact machine, comparing typical standard strapped paper skids with skids strapped the Signode way without compression and skids strapped the Signode way with compression. Here are the results.

PAPER SLIPPAGE, STRAPPED PAPER SKIDS, AFTER 5 IMPACTS



The Signode way, with or without compression, actually costs you less for materials! And it means top value paper for your customer...more usable sheets per skid; fewer customer complaints; flat, square skids your customer (and you) can triple deck. Write today for all the facts.



SIGNODE STEEL STRAPPING CO.

2672 N. Western Avenue, Chicago 47, Illinois

Offices Coast to Coast. Foreign Subsidiaries and Distributors World-Wide
In Canada: Canadian Steel Strapping Co., Ltd.; Montreal • Toronto



O-110
TITANIUM DIOXIDE

FOR GOOD WATER DISPERSION

Used extensively in the manufacture of paper and paper coatings, O-110 offers low binder absorption, is easily dispersible, and provides outstanding opacity with good whiteness. Ask your Cyanamid Pigments representative for complete information.

CYANAMID

AMERICAN CYANAMID COMPANY, Pigments Division
Branch Offices and Warehouses in Principal Cities
30 Rockefeller Plaza, New York 20, N. Y.

NEW EQUIPMENT

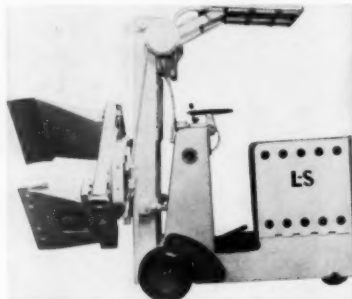
Largest Tramp Metal Detectors



... ever produced were installed recently to inspect pulp logs at plants of Anglo-Canadian Pulp & Paper Mills Ltd. and Gaspesia Sulphite Co. Ltd. in Quebec. Installation was by Measurement Engineering Ltd. Units will detect any piece of metal as large as a 2-in. nail and will automatically stop the conveyor so that "defective" log may be removed. Above unit has aperture measuring 60 X 48 in., largest to date, but not necessarily the practical limit. Further details are available through Meltronics Inc., 1010 N. Main St., Elkhart, Ind.

Electric Fork Truck

... Revolving Roll Grab



Applications: For handling paper rolls.
Advantages: A revolving paper roll grab and pressure regulator valve and gauge for precise clamping pressure are now offered on the Model E SpaceMaker unit. Contact pads on the roll grab have durable high-friction surface for positive handling with minimum clamping pressures, eliminating roll distortion.
Specifications: Model is capable of handling a roll range of 26 to 50 in. in both vertical and horizontal position. Clamp is available with 180°, 270° and 360° rotation to suit needs of the handling operation.

Supplier: Lewis-Shepard Products Inc., 125 Walnut St., Watertown 72, Mass., Tel: Watertown 4-5400.

Conical Refiner

... Small but Efficient



Applications: For mills with refining needs of between 15 and 75 tons per 24 hrs.

Advantages: Incorporating the features of the Claflin 303—including efficiency on all types of furnish, Model 202 differs from the earlier model only in size. Its ruggedness of construction is said to be equal to 303 and is designed to withstand operating pressure of 100 psi.

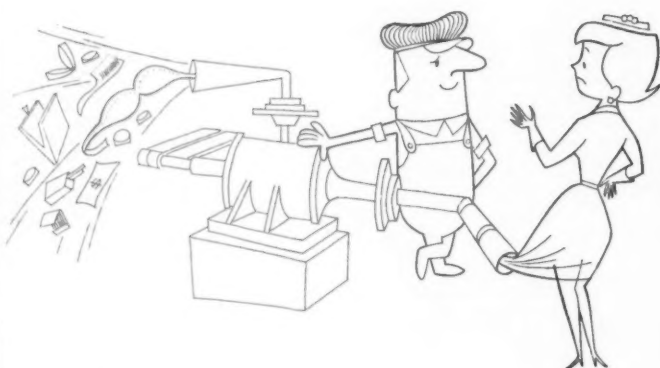
Specifications: Features include: oil mist lubrication; microfeed plug adjustment calibrated for accurate positioning and movement to within 0.0005 in.; split design in the large reinforced head to assist in changing fillings; center or tangent discharge pipes cast as part of the shell housing to eliminate necessity of dismantling piping when disassembling. One-setting coupling requires no change of setting during the life of the filling.

Supplier: Emerson Mfg. Co., div. of John W. Bolton & Sons Inc., 9 Osgood St., Lawrence, Mass., Tel: MURdock 6-6171.

WEMCO® the INCREDIBLE Torque-Flow Pump

pumps almost everything

(what will go in will come out)



secret:

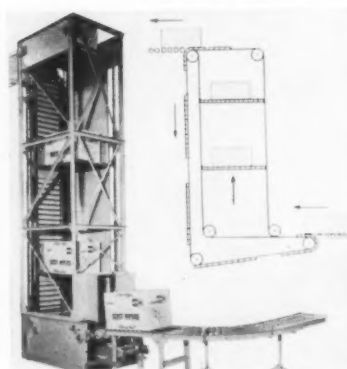
recessed impeller; continuous open passage

(completely non-clogging)

Western Machinery Company 650 Fifth Street • San Francisco, Calif.

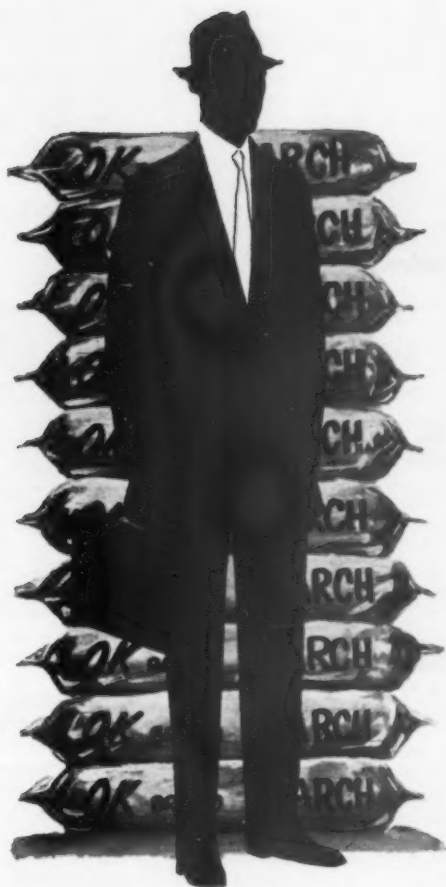
Vertical Conveyor

... Self-Loading, Unloading



Applications: For vertical movement of packaged or unit commodities.

Advantages: This "revolutionary new principle" incorporates the continuity of a belt conveyor. It loads and unloads itself simply and automatically. Unit is said to take less floor space than a monostrand or straight-lift con-



PRODUCTS and SERVICE...

OK BRAND **KEOGEL** Pregelatinized—ready to use—beater starch.

OK BRAND **KEOTAC** Cationic—effective—economical wet end additive.

OK BRAND **KEOZYMES** Enzyme converting starches for sizing and coating adhesives.

OK BRAND **KEOCLORS** Oxidized starches—complete line for sizing and coating adhesive application.

OK BRAND **KEOGUM** A new line of corn starch derivatives for sizing and coating adhesive application.

OK BRAND **KEOFILMS** Economical—controlled viscosity thinboiling starches for special sizing applications.

to meet your changing needs

Mistakes are costly. That's why you'll want to rely on Hubinger products and field service. For over three-quarters of a century, we've been developing, testing, and manufacturing starches and adhesives—always looking for new and better products. And, these products are serviced by trained field personnel, men who can help you solve the most complicated starch and adhesive problems. If your mill needs new starch products to meet special specifications, let our nearby Hubinger paper-starch technical service representative help you. You can depend on him—and Hubinger products—to meet your changing needs and do so economically. Just phone or write us.

THE HUBINGER COMPANY / Keokuk, Iowa
New York • Chicago • Los Angeles • Boston • Charlotte • Philadelphia

NEW EQUIPMENT

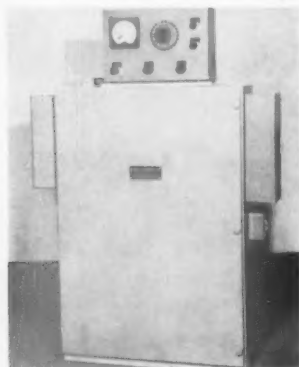
veyor, is said to be less costly than the other types. Escaveyor, says the manufacturer, is "ideal for vertical movement of commodities where lack of space prohibits installation of ordinary inclined conveyors."

Specifications: Unit may be used in up-service, down-service or may be made reversible. Basic new principle provides horizontal flights for carrying that fold automatically to assume a space-saving vertical position for the return trip. Escaveyor is available in a wide range of capacities.

Supplier: Standard Conveyor Co., 33 N. W. 2nd St., N. St. Paul 9, Minn., Tel: SPring 7-1355.

Machine Drive Speed Control

... Accurate to Within 0.1 %



Applications: To maintain the speed of steam turbine-driven papermaking machinery to within 0.1% of any set speed throughout a range of 10:1.

Advantages: The Dacca (digital-analog control apparatus) governor control can be supplied to either new or existing installations. A new completely static governor makes high accuracy possible.

Specifications: Electric speed signals

from the governor are fed to an electric-hydraulic converter. An oil-pressure speed signal from the converter operates a standard servomotor. System includes a control panel that can be mounted at either end of the paper machine. A present speed control device is also provided so that speeds for wash, clean-up and papermaking operations can be selected automatically.

Supplier: Westinghouse Electric Corp., P. O. Box 2099, Pittsburgh 30, Pa., Tel: EXpress 1-2860.

Polyethylene Melt Coater

... for Coating Cut Sheets



Applications: For coating cut sheets of paper and paperboard with low-molecular weight polyethylene.

Advantages: Unit—a modified Steine-mann curtain coater—employs a "unique" method of applying polyethylene. Stock to be coated is placed on a continuous moving belt, assuring even flow of stock through the coater. Stock passes through a uniformly thin curtain of polyethylene that is forced under pressure through a finely-machined and adjustable slot in the head above.

Specifications: Coating thickness is controlled by regulating stock feeding speed, rate of flow of the coating material, head height and pressure. Overflow material is recycled. Stock with die-cut holes or irregular edges may be coated. Speed may be ad-

justed between 100 and 950 linear fpm, using a 100% polyethylene coating consisting of 50% Epolene C and 50% Epolene LV.

Supplier: Wilco Machine Works, P.O. Box 3722 Municipal Airport, Memphis, Tenn. Tel: WHitehall 8-4555.

Tube-Cooled Motor

... Many Uses



Applications: In standard enclosed and explosion-proof construction, for pumps, compressors, fans and blowers, mixers, mills, crushers, conveyors, presses, special industrial machinery and refiners, etc.

Advantages: The Tube-Cooled air-to-air heat exchanger motors are designed to operate in unfavorable environmental conditions, providing protection against excessive moisture, oil vapor, chemicals, alkalies, coolant and air-borne dust, sand, dirt and metallic particles.

Specifications: Range is up to 2,000 hp. For hazardous locations, explosion-proof construction carries Underwriters Laboratories label Class 1, Group D. Features include cooling system, corrosion-resistant construction, capsule type split sleeve bearings and pressure-lubricating systems with oil level indicators.

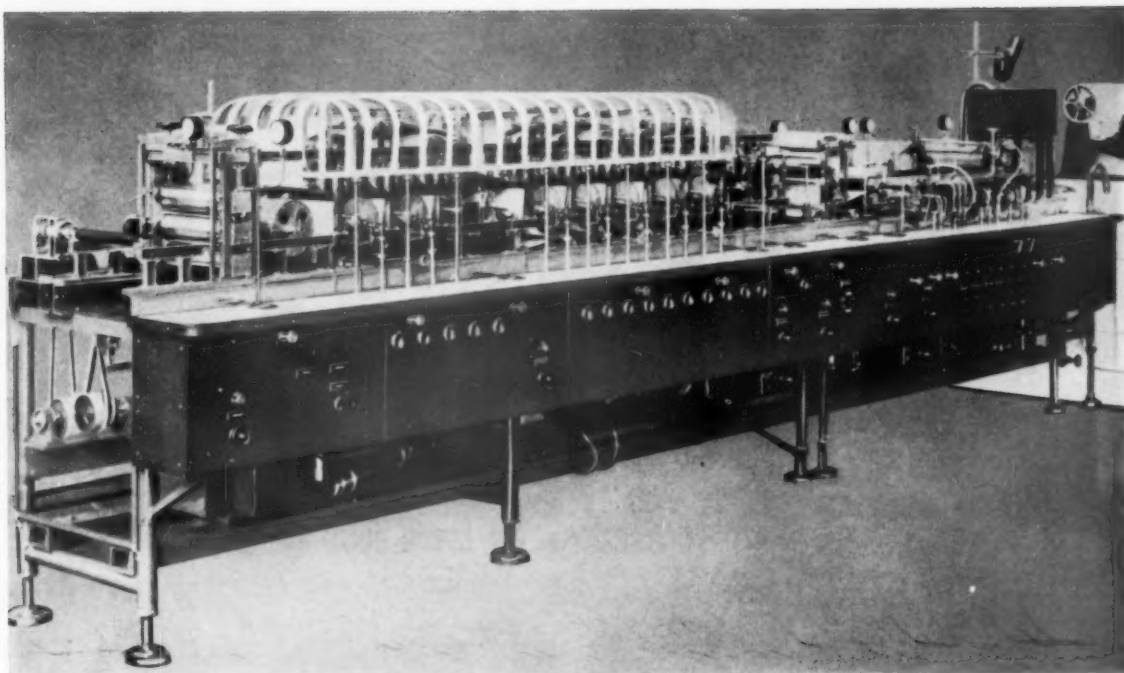
Supplier: Louis Allis Co. (Bulletin #2400), Dept. P, 427 East Stewart St., Milwaukee 1, Wis. Tel: (K. J. Kraft) HUmboldt 1-6000.

Knox Felts

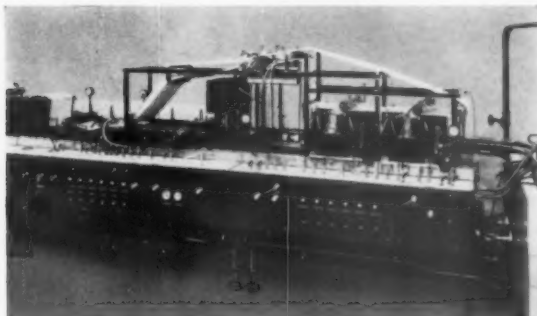
KNOX WOOLEN COMPANY

CAMDEN, MAINE

America's First Manufacturer of Endless Paper Machine Felts



NEW P&W MIDGET FOURDRINIER PAPER MACHINE



The standard P&W Midget Fourdrinier model can also be operated in combination with miniature cylinder molds to provide more versatile sheet formation experiments.

Present users of the P&W Midget Fourdrinier Paper Machine include: West Virginia Pulp & Paper Co. • U. S. Dept. of Agriculture—Peoria Lab • Nat'l Bureau of Standards—Washington • Hurlburt Paper Company • E. I. Dupont de Nemours & Co., Inc. • R. J. Reynolds Tobacco Company • Forest Products Lab.—Philippines • Forest Products Lab.—Pakistan • U. S. Naval Laboratory.

Permits Precise Small-Scale Test Runs of a Wide Variety of Paper Formulations

As little as 5 lbs. of stock is all it takes to start the P&W Midget Fourdrinier making a continuous sheet of paper which can be successfully duplicated on a full-size paper machine. Such test runs effect a significant saving in raw materials, manpower and production machine time.

The P&W Midget Fourdrinier is also of special interest and value to educational institutions and technical laboratories. It is safe, clean and easy to operate. One man only is needed to adjust temperatures and pressures for a wide variety of paper making experiments.

SPECIFICATIONS

Paper Quality—Comparable to full-size Fourdrinier products
Weight of paper—12-120 lbs.
Output—up to 3.3 lb./hr.

Speed—2-8 ft./min.
Overall length—14 ft.
Overall width—33 in.
Working width—9 in.

Write for full descriptive literature.

THE PARSONS & WHITTEMORE / LYDDON ORGANIZATION

World leaders in the development of pulp and paper mills for the use of local fibers

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Yes, when you think about it, bright white space is what EDGAR PAPER CLAYS are—and shipped to you in the most convenient form—bag, bulk or slurry—rail or truck.

Step #1 in the preparation of this "bright white space" is selective mining of prime kaolin clay . . . Step #2 is water washing and fractionation with controlled viscosity and particle size to each papermaker's specification . . . Step #3—drying and large volume storage for prompt deliveries.

And—over 1,000 control tests per day to assure you highest quality Edgar clays.

Help yourself to "bright white space" in your papers.

Call M&C for ample samples, complete technical service.

EDGAR PAPER CLAYS



Minerals & Chemicals Philipp CORPORATION

5005 ESSEX TURNPIKE, MENLO PARK, N. J.

"MAINTENANCE?" "NONE!"

reports the Mead Corporation about its Westinghouse AVR adjustable-speed drives



"Not a minute's maintenance time has been required by our Westinghouse static-powered adjustable-speed drives," reports Mr. C. H. Reno, Electrical Foreman of Mead's Escanaba, Michigan, Division.

Operating 24 hours per day, Westinghouse AVR drives are used at Escanaba to drive constant displacement pumps moving color mixture to the coating process. "On this important operation," continues Mr. Reno, "any stoppage or failure would prove very costly. We must have complete reliability."

Westinghouse AVR drives save in other ways, too. They

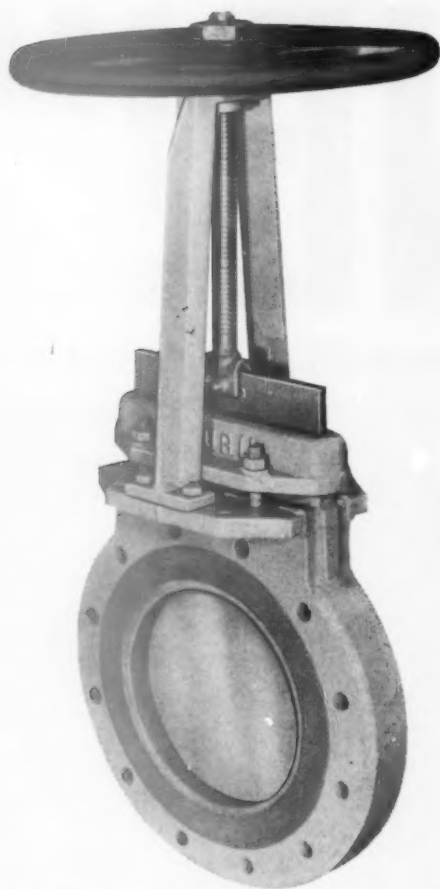
take up only one-half the production floor space required by conventional motor-generator drives. And, because they're much lighter in weight, Westinghouse AVR drives are easier to install and don't require heavy-duty concrete bases.

How about your plant? Couldn't you benefit from these same savings? Ask your nearby Westinghouse salesman to give you all the facts. Available for use with motors 1 to 200 hp, constant torque over an 8 to 1 speed range . . . or with constant hp speed ranges . . . completely static . . . no moving parts to weaken from wear and fail.

J-22153

YOU CAN BE SURE...IF IT'S **Westinghouse**

THE PRICE IS LOW....



AND THE COST GETS LOWER EVERY DAY!

With their freedom from maintenance, DeZurik Knife Gate Valves reduce costs every day! Add to this their long life and low original cost, and you get unsurpassed valve value. For more information, write for Bulletin 300.



New Orr Felt Rep

Bill Ginn is now representing Orr Felt & Blanket Co. in the West Central territory (Colorado, Iowa, Kansas, Missouri, Oklahoma, southern Illinois and southern Indiana). This, according to Felt Sales Mgr. D. C. Spencer, allows Bill Ashton to devote his entire time to covering New York State (not including the Buffalo area).



News of the Suppliers . . .

Sprout, Waldron & Co., Inc., Muncy, Pa., has placed in operation what is believed to be "one of the most modern testing laboratories available to industry today." The 25,000-sq. ft. four-story structure as closely as possible approaches in-plant conditions. Included in the equipment are the following units: Size reduction; size classification; mixing and blending; pelleting, and materials handling. . . . Chicago Bridge & Iron Co. has purchased the field automatic overlay welding operations of Portland Co. As part of the transaction, major personnel of the Portland overlay welding group join CB&I. Automatic overlay welding is used to provide corrosion- and erosion-resistant linings for interiors of carbon steel tanks and towers designed for high-pressure service at pulp mills, chemical plants, etc. . . . Wolverine Equipment Co., manufacturer of high-velocity dryers, was to occupy new headquarters in Cambridge, Mass., about June 20. The company's former address was 31 Main St., Cambridge. . . .

Celanese Corp. of America will expand its Pampa, Texas plant for the production of higher acrylate esters, members of a family of petrochemicals used by the paper, textile and other industries. . . . Work is underway on expansion of manufacturing facilities at the main plant of Bauer Bros. Co. in Springfield, Ohio. The current project is part of the firm's continuous long-range expansion program designed to provide maximum flexibility of operations. . . .

Bristol Co., Waterbury, Conn., has acquired Hanson-Corrill-Brian Inc. of Glen Cove, N.Y., manufacturer of digital data logging equipment and other electronic computing devices. . . . Nopco Chemical Co., Newark, N.J., has installed new laboratories for its Industrial & Fine Chemicals div. The facilities are designed to duplicate many of the processes found in such industries as paper, textiles, etc. Paper specialists can simulate pulping, stock preparation, papermaking and coating operations. . . . E. F. Houghton & Co. has opened a new plant in South San Francisco, Cal., to handle its increased West Coast business. Facility has provision for sulfonation, saponification, compounding, esterification and condensation reactions. Products include defoamers, wetting agents, felt cleaners, grinding compounds and specialty lubricants. . . .

Wm. E. Gundlach For Bolton in Ohio

He will handle John W. Bolton & Sons Inc.'s full line of machine knives in Ohio and western Pennsylvania. Prior to joining the Lawrence, Mass. company, Mr. Gundlach was with Wheeling Corrugating Co., subsidiary of Wheeling Steel Corp. His home is in Hudson, Ohio.



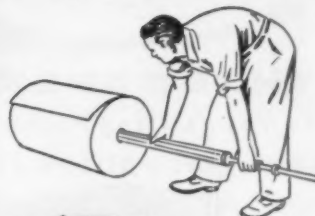
MEETING DATES

- August 29-September 10
Fifth World Forestry Conference
 Univ. of Washington, Seattle, Wash.
- September 1-3
New York-Canadian PIMA (Fall Meeting)
 Saranac Inn, Upper Saranac Lake, N. Y.
- September 6-9
Technical Section CPPA (Summer Meeting)
 Banff Springs Hotel, Banff, Alta.
- September 18-21
National Paper Trade Assn. (Semi-Annual Fall Meeting)
 Conrad Hilton, Chicago
- September 19-20
Pacific Section TAPPI (Annual Seminar)
 Seattle, Wash.
- September 22-23
Northwestern PIMA (Fall Meeting)
 Northland Hotel, Green Bay, Wis.
- September 22-23
Pacific Section TAPPI (Annual Seminar)
 Portland, Ore.
- September 22-24
Northeastern PIMA
 Poland Spring House, Poland Spring, Maine
- September 27-29
11th TAPPI Testing Conference
 Pantlind Hotel, Grand Rapids, Mich.
- September 30-October 1
Pennsylvania-New Jersey-Delaware PIMA (Fall Meeting)
 Pocono Manor Hotel, Pocono Manor, Pa.
- October 6-7
National Assn. of Corrosion Engineers (Western Region Conference)
 Sheraton-Palace Hotel, San Francisco, Cal.
- October 6-7
5th TAPPI Deinking Conference
 Conway Hotel, Appleton, Wis.
- October 6-8
National Assn. of Corrosion Engineers (Western Region Conference)
 Dinkler-Plaza Hotel, Atlanta, Ga.
- October 7
Paper Mill Men's Club of Southern California (25th annual Hi-Jinks)
 Fox Hills Country Club, Los Angeles
- October 7-8
Connecticut Valley PIMA-New England TAPPI (Joint Fall Meeting)
 The Shine Inn, Chicopee, Mass.
- October 10-13
10th Corrugated Containers Conference
 Royal York Hotel, Toronto, Ont.
- October 11-14
National Assn. of Corrosion Engineers (Northeast Region Conference)
 Prichard Hotel, Huntington, W. Va.
- October 12-14
Southern and Southeastern PIMA (Joint Fall Meeting)
 Williamsburg Inn & Lodge, Williamsburg, Va.
- October 17-19
15th TAPPI Plastics-Paper Conference
 Hotel Syracuse, Syracuse, N. Y.

PULP & PAPER — September 1960



These famous shafts
 mean easier roll handling,
 faster, at lower cost!



Tidland
PNEUMATIC SHAFTS

for all roll winding,
 and unwind equipment

Light, strong, easy-to-use
 for fast set-ups. Positive
 uniform, non-slip grip.
 No damage to cores or
 material. Collapsible, instant
 release! A complete line,
 custom-fitted to any need,
 any length, any diameter,
 for any size rolls.

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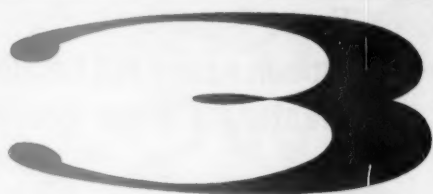
CAMERON MACHINE COMPANY
 Franklin Road, Dover, N. J.

Canada: Cameron Machine Co. of Canada, Ltd.
 14 Strachan Ave., Toronto, Ontario

France: Cameron Europe S/A
 5 Rue de Prony, Paris (17e) France

Brazil: Cameron Maquinas Ltda.
 Rua 24 de Maio, 104-5°, Sao Paulo

AA-366

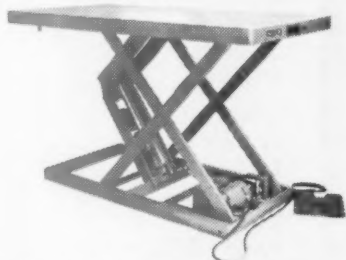


THREE ANSWERS

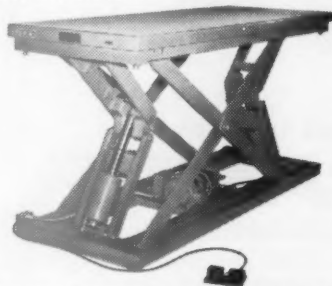
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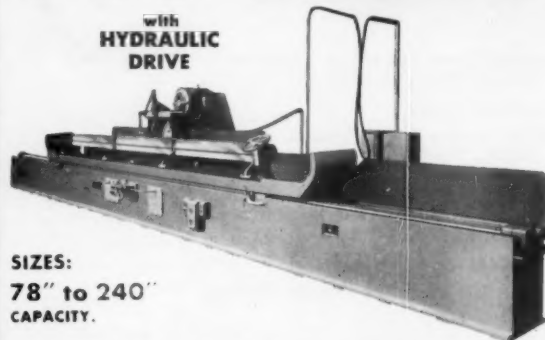
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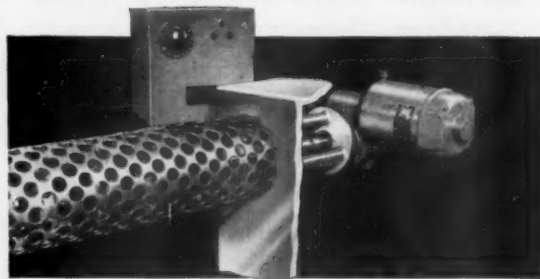
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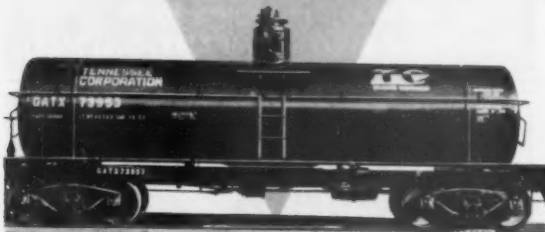
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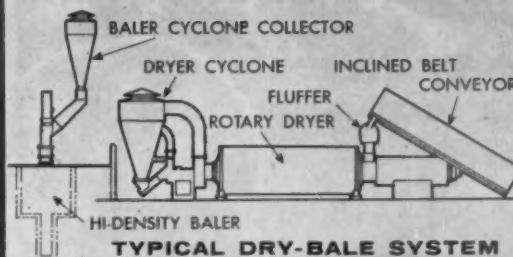


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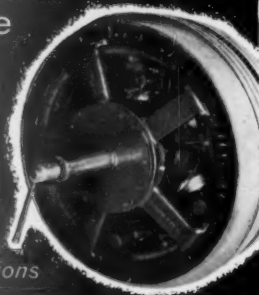
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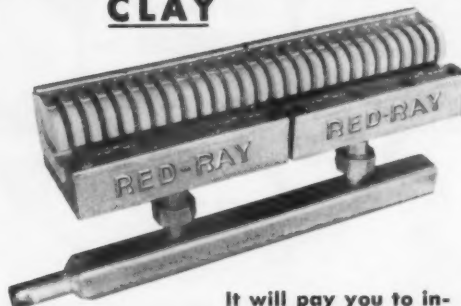
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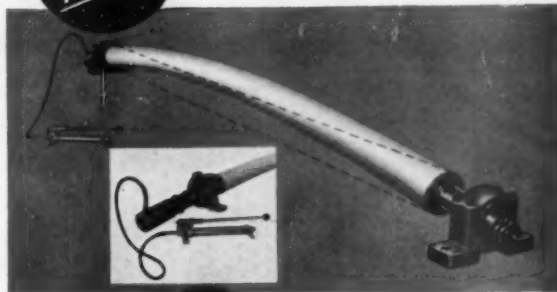
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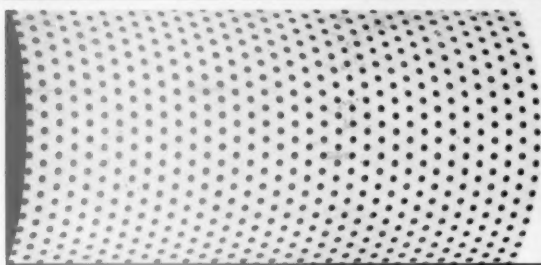
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The Last Word **PULP & PAPER** Editors' Page

National Forest Products Week

At long last, it appears there will be a week devoted to the industry. Senator John L. McClellan has introduced a joint resolution calling for the establishment of a National Forest Products Week, to begin the third Sunday in October, on an annual basis.

It may not be a bad idea for the pulp, paper and paperboard industry to adopt its own poster to promote National Forest Products Week and it has one already made to order. We refer, of course, to the West Virginia Pulp and Paper Co.'s photograph showing a typical American family surrounded by paper and paperboard products. We liked it so much we used this picture on the cover of our 1960 WORLD REVIEW. Incidentally, the "model wife" in the photograph is Mrs. Gene Bradnick (he's Westvaco's public relations director).

The photograph shows at a glance how much the average family depends upon paper. Eugene Cooney, manager of the Import Committee of the Paper Industry, used some reprints of this photograph when he testified in Washington before the Committee on Reciprocity Information on how important paper is to the U.S. and the world. He said that the photograph made a stronger impression than all the words he had been saying.

Naturally, there might be some reluctance on the part of paper companies to use a poster produced by a competitor. Perhaps West Virginia would "donate" the use of the photograph to the industry for use during National Forest Products Week. That is, if the law is passed. We hope it is.

Plug For Foresters

Both Weyerhaeuser Co. and New York Life Insurance Co. are to be complimented on their advertisement on a career in forestry. The ad, the 42nd in a series on various professions, is bylined by Weyerhaeuser Chairman Frederick K. Weyerhaeuser. It is a fine tribute to the nation's 17,000 foresters who protect its 664,000,000 acres of forest land.

The ad, scheduled in national consumer magazines, is also a tribute to the forest management policies of the industry and Mr. Weyerhaeuser also stresses the value of the forest products industry to the nation's economy.

"... We should remember that forests exist to be used. We must have their products to live. . . . These forests support an industry with no less than 1,640,000 employes and a volume of \$25 billion a year. Out of the forests come the world's oldest and newest products: lumber for construction and furniture; paper for printing and 1,000 additional purposes; cellulose for ammunition and photographic film; pharmaceuticals; sugar, ethyl alcohol, plastics and countless more," says Mr. Weyerhaeuser.

Who's Got the Oldest?

New or recently modernized equipment is (in the broad sense of the term) an "everyday occurrence." A month certainly never passes without announcement of "ultra-modern paper machines" being installed in at least a half-dozen mills. And, certainly, "multimillion-dollar expansions" have become commonplace. Well, almost.

But, what about the real veterans of the industry? The

machines that were in faithful production before many of us saw the light of day? What about a little publicity for the old reliables that are still maintaining production schedules even in the face of stiff competition from the new models.

A Case in Point: Crown Zellerbach Corp.'s West Linn (Ore.) div. looks to the past as well as the present. The mill, now in the midst of a \$4,500,000 modernization, is a principal West Coast producer of coated paper and a leading supplier of newsprint in the area. Total daily capacity approximates 700 tons.

New machines may come (and they may go), but No. 8 seems to be a permanent part of the operation. Its record indicates 82 years of papermaking. And the unit still can be prodded into production of 12 tons of coarse wrapping or paper core stock daily.

Bearing the insignia of Union Machine Works, Fitchburg, Mass., the machine was installed at Park Place, Ore., in 1875 as the "thundering giant" of a mill that has long since disappeared. It was moved to Camas in 1901. And during World War I it was torn down and reassembled at West Linn to produce sulfite pulp for gun cotton.

Comments from other mills laying claim to older machines are welcome.

A Paper Exhibit at The World's Fair

There is some talk, and it is still in the early stages, of the industry sponsoring on a cooperative basis an exhibit at the 1964-65 New York World's Fair. We hope the idea succeeds because it sounds like a fine opportunity to present to the world the contributions of the paper industry.

Such an idea immediately conjures up in our minds a host of ideas. As we understand it, the exhibit building must be temporary and must be removed after the Fair is over. The building plans must be approved by the World's Fair corporation. Why not a whole building made of paper in some form or another? Some work has been done along these lines. How practical it may be, we don't profess to know; but it may be worth looking into.

Perhaps it could be called Paper City, U.S.A. and would show the full range of the industry's products. Various exhibits could show how much paper contributes to the average United States citizen's well-being. There might be exhibits showing how much the average U.S. person consumes in a year of newsprint, writing papers, tissues, paper cups, paper plates, paper garments, paperboard packaging, frozen food cartons, printing papers, etc.

One theme, for the exhibit might be "Work and Relax With Paper," or the phrase used now, "Paper an Everyday Wonder."

The time to plan is now. Definitely, the industry must use a fresh approach. The typical paper machine exhibit may not be a sufficient attraction. Who knows, by 1964, the industry may have entirely different paper machines, using less or no water to form the sheet.

Certainly the idea of a Paper City, U.S.A. can present to the many millions of people who are expected to visit the Fair, a true image of the Paper Industry. Here, the industry can speak up for itself on stream improvement, air pollution, forest management.

We'll have more to say on Paper City, U.S.A.

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